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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 2 JUNE 1951 No. 6

SPECIAL FEATURES IN THIS ISSUE

A Selective Annotated Bibliography on Climatology of The Middle East

Cumulative Author and Subject Indexes (Vol. 2, No. 1–6)

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 100 to 200 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Vol. 1, No. 1–11, Jan.–Nov. 1950 carried the following bibliographies: *Atmospheric Pollution, Aerobiology, Cloud Physics and "Rainmaking," Hail, Tornadoes, Volcanic Dust, Climatic Changes, Thunderstorms, Icing, Acoustical Propagation* and *Evaporation.*

Bibliographies published this year were:

1. **Extended Forecasting,** Vol. 2, No. 1, Jan. 1951.
2. **Long Range Forecasting,** Vol. 2, No. 2, Feb. 1951.
3. **Soil Temperature,** Vol. 2, No. 3, March 1951.
4. **Constants, Units, Tables and Diagrams,** Vol. 2, No. 4, April 1951.
5. **Climate of the Near East,** Vol. 2, No. 5, May 1951.
6. **Climate of the Middle East,** Vol. 2, No. 6, June 1951.

Forthcoming bibliographies will be:

7. **Special Winds,** Vol. 2, No. 7, July 1951.
8. **Radar Storm Detection,** Vol. 2, No. 8, Aug. 1951.

Other bibliographies in preparation are: *Carbon Dioxide in the Atmosphere, Climate and Cancer, Machine Methods in Meteorology, Microwave Transmission, Mountain Meteorology, Objective Forecasting,* and *Turbulence.*

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the June and December issues cumulative indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used in this issue may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DSG:	U. S. Army Medical Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.
NN:	New York Public Library, New York, N. Y.
NNA:	American Geographic Society Library, New York, N. Y.
NNM:	American Museum of Natural History Library, New York, N. Y.
NNZ:	Zionist Archives and Library, New York, N. Y.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicats a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example, Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

GENERAL METEOROLOGY

2.6–1 551.5:551.58(02)

Hanzlík, Stanislav, **Základy meteorologie a klimatologie.** [Review of meteorology and climatology.] Prague, Nakaldem Ceske Graficke Unie A. S., **1947.** 253 p. 80 figs., cloud photos, 10 plates. **DWB**—The author attempts to combine in one textbook the basic principles of dynamic and synoptic meteorology and climatology to be used in college courses in Czechoslovakia. The material, while not as elementary as is the case in most courses for pilots or geography teachers, is naturally not as comprehensive as advanced courses in the meteorology departments of the better universities. The subjects of radiation and radiative balance in the troposphere and stratosphere, instrumentation, general and local circulation, hurricanes, tornadoes, synoptic meteorology, micro or local climatology and clouds are treated with unusual thoroughness. The climate of each continent and ocean is dealt with briefly. *Subject Headings:* **Meteorology, Climatology, Textbooks.**—*M.R.*

2.6–2 551.5:06

Godson, Warren L., **The Royal Meteorological Society Centennial Celebrations and present trends in meteorological research in the United Kingdom.** *Royal Meteorological Society, Canadian Branch,* [*Publications*], 1(5), May **1950.** 15 leaves. Mimeographed. **DWB**—An extensive popular account of a visit to England by the author for the purpose of participating in the Centennial activities of the Royal Meteorological Society. At the Science Museum exhibition in London one of the most popular exhibits dealt with cloud physics. The six symposia held at Oxford are summarized, the ozone spectrometer (Dobson) is described, and visits to the various special branches of the Meteorological Office (Harrow, Dunstable, East Hill) and to the Imperial College of Science and Technology in London, with accounts of equipment, research and other activities are related. *Subject Headings:* **Meteorological services, Royal Meteorological Society, Great Britain Meteorological Office.**—*M.L.R.*

2.6–3 551.5:06 551.501.9

§Viaut, André, **Les moyens dont dispose la météorologie française, ceux qu'il lui faudrait.** [The facilities at the disposal of the French meteorological service, and what it lacks.] *L'Industrie Nationale,* No. 3: 85–100, July–Sept. **1950.** 8 plates. **DLC**—A review of the meteorological service of the world and particularly that of France, which provides assistance for commerce and industry, etc. Emphasis is placed on new facilities such as the network of weather ships in the Atlantic, the radiosonde network, automatic weather stations and new radar devices for sounding the upper air winds. Communication networks are described and needs for the future presented. The illustrations comprise the most recent synoptic charts, radar photographs, instruments and equipment used for special purposes and charts of the networks of oceanic and radiosonde stations. *Subject Headings:* **Meteorological services, Meteorological networks, France.**—*M.R.*

2.6–4 531/534:551.5:016(05)

Applied Mechanics Reviews; A Critical Review of the World Literature in Applied Mechanics and Related Engineering Science. Published by the American Society of Mechanical Engineers, Easton, Penna. Editor: Martin Goland. Subscription and production office, American Society of Mechanical Engineers, 29 W. 39 St., N. Y. 18, N. Y. First issue Vol. 1, No. 1, Jan. 1948. Vol. 4, No. 6, June 1951 latest number received. Approximately 300 p. per volume. Price $12.50; foreign $13.25. Size 11.5x28.5 cm. **DWB**—Now in its fourth year,

this monthly periodical has proven one of the best sources of critical abstracts in many fields of interest to the technical or theoretical meteorologist. Of especial interest are the reviews on acoustics, turbulence, soil mechanics, dynamic meteorology, oceanography and geophysics. Each review is written by an authority on the particular subject, regardless of where in the world he lives. Useful features have been the annual subject and author indexes (amply cross-referenced) and lists of journals (in July and Dec. 1948 issues). In each of the first 4 issues of 1951 there appeared a short summary of advances in a special field of applied mechanics such as turbulence (Feb.) and rheology (April), each prepared by an outstanding authority and containing in addition to a systematic survey of the basic research in that field, short subject indexes to articles previously reviewed in the journal (by number only) and a few additional bibliographic references. *Applied Mechanics Reviews* is edited by MARTIN GOLAND with T. VON KÁRMÁN and S. TIMOSHENKO as editorial advisors and is sponsored by an impressive list of American scientific and engineering associations. A list of reviewers and a list of other abstracting services was published in the Dec. 1948 issue. *Subject Headings:* **Applied mechanics, Turbulence, Geophysics, Bibliographies, Periodicals.**—*M.R.*

2.6–5 551.5:064(68)

Drummond, A. J., **South African Weather Bureau's exhibition.** *Weather*, 6(4):114–116, April **1951. DWB**—Describes exhibit of instruments, synoptic meteorology, climatology and sound films at Industrial Exhibition at Pretoria, Sept. 1950. *Subject Headings:* **Meteorological exhibitions, South Africa.**

2.6–6 551.5:37

Butler, F. H. C., **Short vacation courses in meteorology. Course in meteorology at Juniper Hall, 5–12 September 1951.** *Weather*, 6(4):120–121, April **1951.** 2 plates. **DWB**—In addition to course at Malham Tarn on synoptic meteorology, a course on observations and records is to be held at Juniper Hall. *Subject Heading:* **Teaching of meteorology.**

2.6–7 551.5(02)

*Belinskiĭ, V. A., **Dinamicheskaia meteorologiia.** [Dynamic meteorology.] Moscow, OGIZ, **1948.** 703 p. 162 figs., 57+tables, 40 refs., numerous equations, 23 append. **DLC**—This monumental text, contains many schematic diagrams and models, comprises an exhaustive, theoretical treatment of many aspects of dynamic meteorology, including hydrodynamics, thermodynamics of an ideal gas, of the water phase, of moist air; atmospheric statics (physics of a stationary atmosphere), stability; radiation; the equations of motion in the atmosphere, steady state motions, geostrophic winds in a laminar atmosphere, pressure changes, discontinuity surfaces, kinematics of a baric field, turbulent exchange, structure of turbulence spectrum, change of wind with height in a turbulent atmosphere, energy of atmospheric motions, general circulation of the atmosphere, atmospheric disturbances and their theoretical movements, Kibel's method of theoretical forecasting (23 p.); vertical temperature distribution, radiative equilibrium, diurnal and seasonal effects, transformation of air masses. The appendices contain many extensive, useful tables of physical constants, units, etc. for astronomical, solar and terrestrial phenomena (water vapor and ice, composition of the atmosphere, adiabatic conditions, radiation, coriolis and isobaric units and molecular constants). *Subject Headings:* **Dynamic meteorology, Textbooks.**—*M.R.*

2.6–8 551.5(06)

Reed, John C. and Coolidge, Harold J., **The Alaskan Science Conference.** *Science*, 113(2931):223–227, March 2, **1951. DLC**—Papers on meteorology, geology and oceanography, as well as those covering other fields of science, given at this conference are listed and discussed. *Subject Headings:* **Conferences, Alaskan Science Conference.**—*I.L.D.*

2.6–9 551.5:620.92

Rayski, Jerzy, **O energii atomowej i możliwości jej zastosowania do regulowania pogody.** [Atomic energy and its possible use for control of local weather.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, No. 1:48–57, April **1948.** English summary p. 4. **MH-BH**—Popular

article on nuclear energy and its possible applications. *Subject Headings:* **Weather control, Atomic energy.**

2.6–10 551.5:621.311

Corey, C. P., **The effects of weather upon the electric power systems.** *American Meteorological Society, Bulletin,* 30(7):239–241, Sept. 1949. **MH-BH**—Describes steps to meet bad weather—load shifting after cables are struck by lightning, thawing ice and wet snow; also effects of wind, tides, hot water, sagging of lines on hot days, etc. The odd effect of a total solar eclipse is mentioned. *Subject Headings:* **Industrial meteorology, Power systems.**—*C.E.P.B.*

2.6–11 551.5:621.311

Dryar, Henry A., **Load dispatching and Philadelphia weather.** *American Meteorological Society, Bulletin,* 30(5):159–166, May 1949. 8 figs. Comments by A. E. Davison p. 166–167. **MH-BH**—Contents: Weather a general problem to power systems. Load estimating. Effect of weather on load demands—consistent base load a requirement. Weighting the weather (weights assigned +2% for each 5°F. above or below 65°, +2% for each 5 mi./hr. wind speed, +3% for total cloud, but −for thin cloud). Measuring the weather elements. Load estimating and weather forecasting. Base load indicates trend. Daily capacity schedule. Segregating weather variable unveils other variables. Measurement of effects of sky conditions. *Subject Headings:* **Industrial meteorology, Power systems.**—*C.E.P.B.*

2.6–12 551.5:629.3(98)

Greenaway, K. R., **Experiences with Arctic flying weather.** *Royal Meteorological Society, Canadian Branch,* [*Publications*], 1(9), Dec. 1950. 12 leaves. Mimeographed. **DWB**—A general account of the meteorological aspects of flying in the North American Arctic. Following a survey of weather conditions in each season, the important meteorological elements—wind speed, clouds, fog, blowing snow, temperature, turbulence and visibility—are described. Finally, the salient factors to be forecast and the difficulties experienced in forecasting flying weather are discussed. *Subject Headings:* **Aeronautical meteorology, Arctic flying, Canadian Arctic.**—*M.L.R.*

2.6–13 551.5:551.510.5(06)

Journal of Atmospheric and Terrestrial Physics. Published by Butterworth-Springer Ltd., 4, 5, 6 Bell Yard, Temple Bar, London W.C. 2. Editor in chief: Sir Edward Appleton, F.R.S. First issue: Vol. 1, No. 1, **1950.** Vol. 1, No. 4, **1951** latest number received. Articles in English and German. Contains both original articles and reviews. Price $9.50. Size 25x18½ cm. **MH-BH**—A highly specialized journal of excellent quality devoted mainly to papers on ionospheric research (by means of radio transmission and variations in atmospheric electricity and magnetic phenomena), cosmic rays, acoustical propagation, terrestrial magnetism, auroras and other technical studies on the upper atmosphere. In the first 3 issues articles by Appleton, Nicolet, Chapman, Bartels, Israël, Stetson and many other outstanding geophysicists have appeared. *Subject Headings:* **Upper atmosphere, Ionosphere, Periodicals.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

2.6–14 551.501.45:91:681.14

Skowron, Thaddeus S., **Punch card method of converting geographic coordinates to Universal Transverse Mercator Grid Coordinates.** *American Geophysical Union, Transactions,* 31(4):511–517, Aug. **1950.** 12 figs. **MH-BH**—This paper shows how to compute Universal Transverse Mercator Grid Coordinates from geographic coordinates by means of the punch card and Universal Transverse Mercator Tables. "The general mathematical equations used to obtain Universal Transverse Mercator Coordinates are reduced to combinations of the basic arithmetic operations on the punch card." An actual problem of conversion of geographic

coordinates into Universal Transverse Mercator Grid Coordinates is presented. *Subject Headings:* **Punched card methods, Geography.**—*From author's abstract.*

2.6–15 551.501.6:551.509.317

Jansá Guardiola, José Maria, **El sondeo horizontal y el diagrama sinóptico espacio-temporal.** [Horizontal sounding and the space-time synoptic diagram.] *Revista de Geofísica*, Madrid, 9(35):234–247, July–Sept. **1950.** 12 figs., 5 equations. **DWB**—To deal synoptically with observations by aircraft flying horizontally over the oceans, author has devised a "space-time" method of representation in which, e.g., each isobar of a circular depression filling up is represented by a cone. Various examples are given including an analyzed chart for March 15–25, 1950. *Subject Headings:* **Graphical presentation, Synoptic diagrams, Long range forecasting.**—*C.E.P.B.*

2.6–16 551.501.9(411)

Harper, W. G., **Lerwick Observatory.** *Meteorological Magazine*, London, 79(941):310–314, Nov. **1950.** fig., 3 refs. **MH-BH**—The Observatory was founded in 1921 primarily for magnetic observations. Other work carried on is on auroras, atmospheric electricity, radiosonde and radar, sferics, night sky spectra and ozone. *Subject Headings:* **Lerwick observatory, Atmospheric electricity, Scotland.**

2.6–17 551.501.9

Hauer, Hans, **50 Jahre Observatorium Zugspitze.** [50 years of Zugspitze Observatory.] *Naturwissenschaftliche Rundschau*, 4(1):24–26, Jan. **1951.** 2 photos. **DWB**—Brief history of founding of the Observatory and celebration of its Jubilee. *Subject Headings:* **Zugspitze Observatory, History.**—*C.E.P.B.*

INSTRUMENTS

2.6–18 551.508.2:551.521.63

Sherrod, J., Neuberger, H. and Yerg, D., **New standards for Landsberg's glass rod method of integrating ultraviolet radiation.** *American Geophysical Union, Transactions*, 31(5), Pt. 1:696–698, Oct. **1950.** fig., 3 tables, 5 refs. **MH-BH**—The instrument is a glass rod containing cerium and vanadium which changes from green to purple under UV-light. A set of 12 rods are calibrated by exposing different lengths to UV and viewing longitudinally. *Subject Heading:* **Ultraviolet dosimeters.**—*C.E.P.B.*

2.6–19 551.508.21

Gunn, D. L. and Yeo, Douglas, **The Bellani spherical pyranometer or radiation integrator; the calibration of an improved model, and some suggestions for further improvements.** *Royal Meteorological Society, Quarterly Journal*, 77(332):292–301, April **1951.** 2 figs., table. **MH-BH**—Describes the simple Bellani pyranometer (invented 1836) as improved 1944, using a blackened spherical copper receiver; calibration against Moll pyrheliometer. Discussion of efficiency (75%) and heat losses and reference to biological value of observations. *Subject Heading:* **Actinometers.**

2.6–20 551.508.56:551.507.3

*Reger, Josef, **Doppelanschnitte von Registrierballonen am Observatorium Lindenberg in den Jahren 1936–1937.** [Double theodolite method for sounding balloons at the Lindenberg Observatory during 1936–1937.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(4), **1938.** 25 p. 6 figs., 5 tables **DLC**—The method of double theodolites is used (1) to determine the dependence of the velocity of ascent of sounding balloons upon their size and upon free buoyancy and the extent of the deviations from a mean velocity of ascent, and (2) to control the precision of barometrically determined altitudes and to determine whether the corrections for the temperature compensation of the barometer are correct. Method of setting up apparatus and evaluating double intersection data are described. Measurements of velocity of ascent determined by double theodolite method and comparative measurements between altitudes determined by barometric and trigonometric means are presented in tables and discussed. *Subject Headings:* **Pilot balloon theodolites, Balloon ascension rates.**—*I.L.D.*

2.6–21 551.508.822

*Byers, Horace R. and Bailey, J. F., **A study of the differences in the data from radiosondes released simultaneously from a close network of stations.** Chicago, University, Dept. of Meteorology, Interim Report to U. S. Weather Bureau, Contract No. Cwb-8136, Feb. 1951. 5+leaves. 2 figs., 8 tables, 2 refs. Mimeographed. **DWB**—On six different days between July 12 and Sept. 17, 1947, from 3 to 6 swarms of radiosondes ascents were made from several stations at 2-hourly intervals within a 10-mile radius. It was the purpose of the study to determine if there was any systematic variation in the sampling error during the course of the day. The time of day had no effect on temperature variations and little effect on humidity before 10 a.m. except outside of cloud layers. Sampling errors were no larger than instrumental errors. *Subject Headings:* **Radiosonde errors, Sampling errors.**—*M.R.*

2.6–22 551.508.822:551.557

Ewing, R. A., **The determination of upper winds by electronic means.** Sixth Pacific Science Congress 1947, Proceedings. *Royal Society of New Zealand, Transactions*, 77(5):76–78, Nov. 1949. **DLC**—Discusses advantages and disadvantages of British and U. S. radio-direction finding methods and New Zealand microwave radar. The 700 and 900 megacycle pulse repeater is considered most accurate. *Subject Headings:* **Radiosondes, Upper wind measurements.**—*C.E.P.B.*

2.6–23 551.508.95

Dirnagl, Carl, **An instrument that records the oxidizing effect of the air.** *American Meteorological Society, Bulletin*, 30(6):214–217, June 1949. **MH-BH**—Describes a simple, rapid, automatic oxidizing meter using potassium iodide starch paper, allowing 288 recordings daily. Evaluation of change of color is by color scale or photo-cell measurement. *Subject Headings:* **Oxidization meter, Aran.**—*C.E.P.B.*

SYNOPTIC ANALYSIS AND FORECASTING

2.6–24 551.509.3:629.13(02)

§Diaz, Emilio L. and Moragues, Miguel, **Manual de meteorología.** [Manual of meteorology.] Buenos Aires, Servicio de Imprenta, 1944. 229 p. 84 figs., 14 tables, equations. (Ministerio de Marina, Escuela de Aviación Naval). **DWB**—This text contains chapters which, from the point of view of the synoptic forecaster, go into detail on various practical aspects of atmospheric structure and composition, vertical motions, meteorological elements, general circulation, air masses and fronts, cyclonic storms, clouds, fog, forecasting, map analysis, statistics in meteorology and, finally, a chapter on icing of aircraft. The appendix contains codes, tables, nomograms, forecasting rules-of-thumb in tabular form for various places in the Argentine, and a subject index. Many schematic diagrams and actual examples of charts for Argentina for specific types are included. *Subject Headings:* **Synoptic meteorology, Aeronautical meteorology, Textbooks, Argentina.**—*M.R.*

2.6–25 551.509:65

Bijvoet, H. C. and Bleeker, W., **The value of weather forecasts.** *Weather*, 6(2):36–39, Feb. 1951. 2 figs., 2 refs., equations. **DWB**—Discusses the circumstances in which it would pay a business to take account of weather forecasts, balancing the loss due to weather against cost of precautions. It is concluded that precautions based on forecasts would not necessarily save money. *Subject Headings:* **Weather forecasting, Industrial meteorology.**

2.6–26 551.509.2:621.396

Fidler, James C., **A new approach to weather broadcasting.** *American Meteorological Society, Bulletin*, 30(7):251, Sept. 1949. **MH-BH**—A new, descriptive technique of broadcasting a general weather summary followed by a local forecast is explained. *Subject Heading:* **Weather broadcasting.**

2.6–27 551.509.3:551.579.2

Wilm, Harold G., **Statistical control in hydrologic forecasting.** *Scientific Monthly*, 72(3):185–188, March **1951.** 2 tables, 5 refs. **DLC**—The use of regression equations in forecasting runoff from the estimated water content of snow is discussed and a specific example of their application is presented. *Subject Headings:* **Hydrologic forecasting, Statistics in meteorology.**—*I.L.D.*

2.6–28 551.509.3:551.513

Diaz, Emilio L., **Previsión de la circulación atmósferica.** [Forecasting atmospheric circulation.] *Sociedad Científica Argentina, Anales*, 144(3):297–364, Sept. **1947.** 26 figs., 5 tables, equations. English summary p. 297–298. Reprint available. **DLC**—An attempt at evaluating the general circulation over the Southern Hemisphere (especially in the section from Australia to South America and from the Tropic of Capricorn to the Antarctic) in order to produce rules or guides to forecasting movements of troughs and anticyclones for 2 to 6 (or 8) days. First, the normal surface air flow is studied (from pilot charts); then the conditions prior to a period of strong zonal circulation and blocking action over Argentina, respectively, are investigated. An analysis, with correlation charts of circulation in summer and winter, is given. Finally, the effects of changes in solar radiation on pressure and circulation in the Southern Hemisphere are treated. *Subject Headings:* **Extended forecasting, General circulation, Southern Hemisphere, Argentina, Chile.**—*M.R.*

2.6–29 551.509.3(54)

§Malurkar, S. L., **Notes on analysis of weather of India and neighbourhood.** *India, Meteorological Dept., Memoirs*, 28, Pt. 4, **1950.** p. 139–215. 17 figs., refs. **DWB**—A detailed and scholarly treatment of the problems of synoptic analysis and forecasting from synoptic charts in the Middle East. Chapters are included on (1) mean pressure distribution across the latitudes in the equatorial belt in northern summer, (2) isobaric patterns, (3) isobaric types with given pressure and wind values, (4) mean pressure and wind direction in tropics, (5) evolution of a tropical cyclonic storm, (6) analysis of charts for Dec. 14 and 15, 1945, (7) possible consequences of two tropical cyclones on either side of the equator and (8) partition lines in the tropical belt. Seasonal air mass characteristics and weather types are emphasized. *Subject Headings:* **Synoptic analysis, Air mass characteristics, India.**—*M.R.*

2.6–30 551.509.3:551.515.7(4)

§Walden, Hans, Jaeckisch, H. and Brandt, F., **Zur Vorhersage von Hochdruckgebieten über Nordwesteuropa.** [On forecasting high pressure regions over northwest Europe.] *Annalen der Meteorologie*, 3(9–10):267–283, **1950.** **DWB**—The development of the "northern anticyclone" between Ireland and the Baltic is discussed. A hypothetical pressure distribution and constant dp/dt give an apparent displacement from Azores to England. A similar sequence on March 23–27, 1948, is analyzed in detail (surface and upper air) but is found to be due, in part, to steering of a high level component from W. Similar developments were found in 6 earlier years. Singularities, sunspots and pressure waves are considered as possible causes, but discounted. Five other cases in 1948 are examined and characteristics tabulated; this shows that a deep low in W. Atlantic begins about the same time, but little emerges of help in medium range forecasting. *Subject Headings:* **Weather forecasting, Anticyclones, Northwest Europe.**—*C.E.P.B.*

2.6–31 551.509.318(4)

§Palmén, Erik, **Discussion of problems concerning frontal analysis in the free atmosphere.** *Societas Scientiarum Fennica, Commentationes Physico-Mathematicae*, Helsinki, 8(8), **1948.** 47 p. 25 figs., 10 tables, 17 refs., 22 equations. **DLC**—In the introductory chapter the author treats in detail the dynamics of temperature and wind fields near frontal surfaces and the construction of upper level synoptic charts. Three-dimensional analysis of simple synoptic situations (warm front Jan. 7, 1939 and cold front Feb. 1, 1938) for northwest Europe is presented in the typical Palmén manner (synoptic-dynamic-aerological analysis). *Subject Headings:* **Synoptic aerological studies, Northwest Europe.**—*M.R.*

2.6–32 551.509.33(52)

Sakata, K., **A new classification of season.** *Journal of Meteorological Research*, Tokyo, 2(6):182–190, July 1950. 1 fig., 4 tables, refs., 3 equations. In Japanese, English summary p. 42. **MH-BH**—Author investigated annual variation of mean daily values of meteorological elements at Hamada and found singularities which he regards as transitional points between seasons. *Subject Headings:* **Singularities, Japan.**—*C.E.P.B.*

2.6–33 551.509.532(52)

Ueki, H., **On the prediction of late frost.** *Journal of Meteorological Research*, Tokyo, 2(8):250–251, July 1950. 4 figs., 2 tables, 4 equations. In Japanese, English summary p. (6). **DWB**—Writing t_m = min. air temperature °C, t = temperature at 18 h., d dew point, v vapor pressure (mm. at 18 h.), author finds at Takada

$$t_m = 0.488t - 4.4$$
$$t_m - d = 1.88v - 8.52$$

Subject Headings: **Forecast verification, Frost forecasting, Japan.**—*C.E.P.B.*

2.6–34 551.509.8

†Inwards, Richard (comp.), **Weather lore.** Rev. and amplified by E. L. Hawke. London, Rider & Co., 1950. 251 p. 10 photos, biblio. p. 231–236. **DWB**—The first edition was published in 1869 (91 p.) and was based on a collection of sayings and rules-of-thumb made by the author since his early youth. The second edition came out in 1893, and was double the size of the first (200 p.). The third edition (1898) was expanded to 245 pages. The author was the world's outstanding authority on weather lore, and in 1894–5 was President of the Royal Meteorological Society. The book, which is well-indexed, contains 6 pages of bibliography. The proverbs, etc. are arranged systematically by times and seasons; sun, moon and stars; meteorological elements; instruments; and animals, birds, fish, insects, plants, etc. *Subject Heading:* **Weather lore.**—*M.R.*

2.6–35 551.509.8

Hawke, E. L., **Weather lore.** *Weather*, 5(10):339–342, Oct. 1950. 2 plates. **DWB**—Popular account of weather proverbs, rhymes and beliefs, referring mainly to new edition of Inwards' **Weather Lore.** *Subject Heading:* **Weather Lore.**

2.6–36 551.509.9:66/67

Bates, Charles C., **The status of applied meteorology in the United States in the post-war period.** *American Meteorological Society, Bulletin*, 30(6):199–203, June 1949. photo. **MH-BH**—Describes the history of private meteorological consulting work in industry, causes of its slow progress and prospects for the future. *Subject Heading:* **Applied meteorology.**—*C.E.P.B.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF ATMOSPHERE—IONOSPHERE

2.6–37 551.510.4:546.264:631.4

*Misra, R. K., **Studies on the carbon dioxide factor in the air and soil layers near the ground.** *Indian Journal of Meteorology and Geophysics*, 1(4):275–286, Oct. 1950. 4 figs., 10 tables, 11 refs. **DWB**—Variations in the CO_2 content in the soil, crops and air were studied during the years 1941–1943 at the Central Agricultural Meteorological Observatory. Instruments described and data on diurnal and monthly variations, variation with height and depth, influence of irrigation and crop covers, etc. presented and discussed. More CO_2 in air of crops at night and in winter than in open, by day or in summer, respectively. *Subject Headings:* **Microclimatology, Soil climate, Carbon dioxide.**—*M.R.*

2.6–38 551.510.4:551.508.25

Strong, John, **Experimental infrared spectroscopy.** *Physics Today*, 4(4):14–21, April 1950. 8 figs. **DWB**—The author describes concisely and fully the development of instru-

mentation in infrared spectroscopy since the latter part of the nineteenth century and contemporary research, by the author and by MARCEL GOLAY, on improving the resolving power of spectrometers. The application of infrared spectroscopy to the study of planetary atmospheres, to the constitution of the earth's atmosphere (e.g., the discovery of methane in the earth's atmosphere) and to the study of temperature characteristics of the stratosphere and troposphere is considered. *Subject Hea...* **Atmospheric composition, Infrared spectroscopy.**—*I.L.D.*

2.6–39 551.510.41(45)

*Zanon, P. Francesco Saverio, **Il cloruro di sodio nell'aria al Lido di Venezia.** [Chloride of sodium in the air at Lido, Venice.] *Rivista di Ecologia*, 1(1–2):66–80, **1949.** 1 fig., table, 6 refs. English summary p. 79. **DWB**—On 14 occasions in 1948 and 1949, the air at Venice was analyzed for chloride content (Na and Mg) and the results described for each case and tabulated by element and in connection with the wind, air mass and humidity. The same was done for 9 cases of rain in the same period. Results lie between the high values obtained by JACOBS (1936) at La Jolla, California, and the low values obtained by ALIVERTI at Pavia (1944–45). Apparatus described. *Subject Headings:* **Atmospheric composition, Saline nuclei, Venice, Italy.**—*M.R.*

2.6–40 551.510.5:001

Chapman, Sydney, **Upper atmospheric nomenclature.** *Journal of Geophysical Research*, 55(4):395–399, Dec. **1950.** 3 figs., 4 refs. **MH-BH**—Stratosphere—the nearly isothermal region above the troposphere; mesosphere—the layer between the top of the stratosphere and the temperature minimum somewhat below 100 km.; thermosphere—the layer of increasing temperature above this minimum; homosphere—the part of the atmosphere extending to about 100 km. above the ground which is substantially uniform in composition; heterosphere—the overlying region of different composition; turbosphere—the region up to at least 60 km above the ground where turbulence predominates over diffusion; neutrosphere—region below the ionosphere where electron concentration is insignificant; pause—upper boundary; stratopause, mesopause, homopause, turbopause and neutropause are defined. Peak or level of maximum, mesopeak (ozone peak) and E and F peaks are defined. Incline and decline are parts of "peaked" layers above and below the "peak," "where the defining characteristic is respectively increasing or decreasing upwards," etc. Syncline is a minor minimum lying between a major and minor peak in a layer. The various regions of the atmosphere defined are represented by schematic diagrams. *Subject Headings:* **Atmospheric structure, Definitions.**—*I.L.D.*

2.6–41 551.510.5:001

Selvaggi, Domenico, **Stratificazione e nomenclatura dell'atmosfera.** [Stratification and nomenclature of the atmosphere.] *Rivista di Meteorologia Aeronautica*, 10(2):21–26, April–June **1950.** Italian, French, English and German summaries p. 21. **MH-BH**—Definitions of various layers of the atmosphere (stratosphere, ionosphere, exosphere, tropopause, etc.) as proposed by FLOHN and PENNDORF (1950) are reviewed and discussed at length. *Subject Headings:* **Atmospheric structure, Definitions.**—*M.R.*

2.6–42 551.510.5:629.13

Atmospheric factors. *Flight*, 58(2176):284–285, Sept. 7, **1950.** 4 graphs. **DLC**—The carefully drawn graphs show atmospheric conditions (density, pressure, and temperature as defined in the ICAN standard atmosphere) which affect flight to 80,000 ft. *Subject Headings:* **Aeronautical meteorology, Atmospheric structure.**

2.6–43 551.510.5:629.13

Moreno P., Claudio, **El ambiente del vuelo en relación al progreso aeronáutico.** [Flying atmosphere in relation to progress in aeronautics.] *Nimbus*, 2(5):26–33, Jan.–March **1950.** *Ibid.*, 2(6–7):32–36, April–Sept. **1950. DWB**—A general discussion on progress in aviation and adaptation of human beings to the flying medium. Specific problems which concern the aviation engineer, the psychologist and the physiologist in respect to high altitude and high speed flying, are enumerated in the first article. The second article consists of a brief discussion

of instrumentation and observations necessary for study or knowledge of the atmosphere as a medium for aviation. *Subject Headings:* **Upper atmosphere, Aeronautical meteorology.**—*M.R.*

2.6–44 551.510.53:629.13

Proell, W., **The significance of monatomic cases in planetary space operations.** *Journal of Space Flight*, 2(7), Sept. **1950.** 8 leaves. 9 refs. Mimeographed. **DLC**—General theory of dissociation of gases by ultraviolet radiation is discussed. Since monatomic oxygen constitutes 30 percent of the atmosphere at 100 km. its formation and properties are important for guided missiles, rocket flight in the exosphere or to other planets. The practical and theoretical aspects of monatomic gases and their effect on ramjet flight (with or without fuel) are discussed and calculations given. *Subject Headings:* **Dissociation, Ionosphere, Aeronautical meteorology.**—*M.R.*

2.6–45 551.510.535

Burkard, Otto, **Studie über Höhenschwankungen der F2-Schicht: I.** [Study on the height variations of the F2 layer. I.] *Geofisica Pura e Applicata*, 15(1–2):63–68, July–Sept. **1949.** 3 figs., 4 refs. German and English summaries p. 63. Part II. *Ibid.*, 16(3–4):117–122, April–June **1950.** 3 figs., table, 6 refs. German and English summaries p. 117. Burkard, Otto and Eyfrig, Rudolf, Part III. *Ibid.*, 16(3–4):123–127, April–June **1950.** 4 figs., 6 refs. German and English summaries p. 123. **MH-BH**—Part I—Variations in the height of the F2 layer with time of year and distance from pole are illustrated. Near the equator the amplitude is much less than in the polar regions and there is a double, rather than a single, annual period. Maximum height is at summer solstice in high latitudes and both solstices near equator. Data for Huancayo, Peru and Watheroo, Australia (1938–1949) used in this analysis. Part II—The relation of height (of F2 layer) to sunspot cycles is analyzed. Data for College (Alaska), Washington, San Francisco, Maui, Trinidad and Canberra are used (in addition to Huancayo and Watheroo data). A double period in height variation corresponds to one sunspot cycle at most stations. Part III—Near the equator the minimum height of the F2 layer and the region of maximum concentration of ions vary in opposing senses (directions) with increasing or decreasing sunspot activity. Relations shown graphically for Palau (7°N, 134°E) and other stations. *Subject Headings:* **Ionospheric layers, F layer.**—*M.R.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

2.6–46 551.511

Isimaru, Yukiti, **The mechanism of the earth's atmosphere. (First communication.)** *Fukuoka Meteorological Observatory, Memoirs*, 2(5):1–38, Oct. **1948.** 7 figs., 20 tables, refs., 75 equations. Reprint available. **MH-BH**—Author first states that the tropopause is an ellipsoid of revolution of the atmosphere. He then discusses the heat balance of the atmosphere due to temperature difference equator-pole. Tropopause is the level of balance between gravitation and centrifugal force. A number of theorems about height and temperature relations of the tropopause are set out. Pt. 3 analyzes seasonal variation of surface temperature including effect of land and sea distribution. *Subject Headings:* **Mechanics of the atmosphere, Tropopause.**—*C.E.P.B.*

2.6–47 551.511:551.515.11

Knighting, E. and James, R. W., **Large-scale vortex motion in the atmosphere.** *Royal Meteorological Society, Quarterly Journal*, 77(332):309–310, April **1951.** **MH-BH**—Continuation of discussion in *Quarterly Journal*, 77(331) of paper by James. (*See item* No. 9–53 in Sept. 1950, *Meteorological Abstracts.*) *Subject Headings:* **Cyclones, Vorticity.**

2.6–48 551.511:551.513.1

Priestley, C. H. B., **Physical interactions between tropical and temperate latitudes.** *Royal Meteorological Society, Quarterly Journal*, 77(332):200–214, April **1951.** 1 fig., 8 tables, 14 refs. **MH-BH**—An evaluation of the poleward transport of momentum, heat, water vapor and energy between 900 and 150 mb. at Gibraltar, Habbaniyah, Norfolk Island and Auckland,

all in high pressure belts, confirms that a mean meridional circulation across these belts contributes about half the total poleward transport of energy and momentum, nearly all above 500 mb., mainly at 300–200 mb. Author then attempts to evaluate mean rate of this circulation. The poleward energy transport across 30–35° lat. is calculated for each season (maximum winter, zero summer). Total energy transport between 15 and 50°, 850–220 mb. is 6×10^{26} ergs/day. There is a net equatorward flow of 5×10^{18} g. water/year, equivalent to an average excess precipitation-evaporation in tropics of 1–2 in. *Subject Headings:* **Meridional circulation, Energy transport.**

2.6–49 551.511

†Schmitz, Hans Peter, **Eine approximative Ermittlung der durch Druckänderungen bedingten Vertikalbewegung in der planetarischen Grenzschicht.** [An approximate evaluation of the vertical motion in the planetary boundary layer caused by changes of pressure.] *Meteorologische Rundschau*, 4(1–2):1–7, Jan.–Feb. **1951.** 3 figs., 54 refs, equations. **MH-BH**—Starting with the hydrodynamic equations of motion in the lower atmosphere (up to about 1000 m.), neglecting convective acceleration and vertical changes of austausch coefficient, author then introduces horizontal divergence and by integrating for height obtains the vertical motion associated with isobaric curvature. In all cases investigated, vertical motion is almost entirely a consequence of turbulent friction and is independent of the stationary pressure distribution. The figures show for three hypothetical cases in lat. 50° the total vertical movement and the parts due to friction and frictionless motion. Highly mathematical. *Subject Headings:* **Dynamics of the atmosphere, Vertical motion, Pressure changes.**—*C.E.P.B.*

2.6–50 551.511

Sieber, Peter, **Die quasistationäre Vertikalzirkulation.** [The quasi-stationary vertical circulation.] *Meteorologische Rundschau*, 4(1–2):13–16, Jan.–Feb. **1951.** fig., 15 equations. **MH-BH**—Discusses problem whether a vertical circulation about a horizontal axis is possible without supply of energy from outside. This cannot be shown with the usual assumptions, but its probable development can be deduced from the ageostrophic wind components. *Subject Heading:* **Thermodynamics of the atmosphere.**—*C.E.P.B.*

GENERAL CIRCULATION

2.6–51 551.513:551.553.21

Shuleĭkin, V. V., **Vydelenie mussonnoĭ sostavliaiushcheĭ iz obshchikh potokov v atmosfere.** [Separation of the monsoon component from the general circulation of the atmosphere.] *Akademiia Nauk, SSSR, Doklady*, 71(6):1057–1060, April **1950.** 4 figs., 3 refs. **DLC**—From charts of the average temperature at different altitudes it is possible to determine the vertical extent of the counter-monsoon currents, the strong development of the winter monsoon and the weak summer monsoon in mid latitudes. *Subject Headings:* **Monsoon circulation, General circulation.**—*M.R.*

2.6–52 551.513.1

Starr, V. P. and White, R. M., **A hemispherical study of the atmospheric angular-momentum balance.** *Royal Meteorological Society, Quarterly Journal*, 77(332):215–225, April **1951.** 3 tables, refs., 9 equations. **MH-BH**—Using data from 16 radio or pilot balloon stations round the world near 31°N. for Feb. through July 1949, total meridional transport of relative angular momentum is calculated from 2000–50,000 ft. The dominant contribution is the eddy transport due to horizontal exchange processes, which increases up to 40,000 ft. and amounts to about 26×10^{25} c.g.s. units for the whole of lat. 31°N. Transport by *mean* meridional circulation is negligible. *Subject Headings:* **General circulation, Momentum transfer, Energy transport.**

2.6–53 551.513.1

White, Robert M., **The meridional eddy flux of energy.** *Royal Meteorological Society, Quarterly Journal*, 77(332):188–199, April **1951.** 7 figs., 3 tables. **MH-BH**—Describes method of computing total meridional flux of heat across a complete circle of latitude and shows the computed transport of sensible heat, of latent energy, and the total, 25–75°N., 1000–100

mb., from soundings over North America in Feb. and Aug. 1949. Transport of sensible heat has a maximum in 50–55°N. and a large annual variation; in low latitudes it may be towards equator. Transport of latent heat is poleward, slight maximum about 45°N., greatest at ground level. *Subject Headings:* **Turbulent exchange, General circulation.**

2.6–54 551.513.2:551.509

Yamashita, Y., **Influence of easterly trough on Japan.** *Journal of Meteorological Research*, Tokyo, 2(9):294–300, Nov. **1950.** figs., 3 tables, 8 refs. In Japanese, English summary p. (8). **MH-BH**—Synoptic and aerological data are analyzed to show the influence of easterly troughs on rainfall in Japan during the late spring and summer. A warm moist tongue usually precedes the heavy rainfall at a time when the equatorial front is advanced well toward the northwest. *Subject Headings:* **General circulation, Precipitation, Easterly troughs, Japan.**—*M.R.*

ATMOSPHERIC DISTURBANCES

2.6–55 551.515.13 551.553.8

§Christie, Ernest J., **Report on the storm of November 25, 1950.** New York, U. S. Weather Bureau, Dec. **1950.** 21+p. charts. **MH-BH**—A detailed summary of conditions which preceded, accompanied and followed the violent wind storm which struck the New York area about 3 p.m. on Nov. 25, 1950. Records, both automatic and derived, are presented; all forecasts and warnings for the New England and Middle Atlantic Coast area for the period are included. Analyzed synoptic charts from 1230Z on Nov. 24th to 0030Z on Nov. 27th show the intensity and erratic behavior of this extratropical cyclone. Consequences of the storm in property damage are summarized. *Subject Headings:* **Cyclonic storms, Wind storms, New York City.**—*M.R.*

2.6–56 551.515.13 551.578.45

§Smith, Clarence D., Jr., **The destructive storm of November 25–27, 1950.** *Monthly Weather Review*, 78(11):204–209, Nov. **1950.** 11 figs., 2 tables, 8 refs. **MH-BH**—A secondary low which first appeared over North Carolina and western Virginia on Nov. 24, 1950, developed into a major storm. Cold air was swept rapidly around the south side of a deep cold low over Wisconsin, rapidly transferring the center from the Lakes to the Middle Atlantic States. As the center of the secondary moved northward it redeveloped to the west of the Appalachians, attended by record snowfalls over the Ohio Valley. Other disastrous effects were due to record minimum temperatures (up to 11° lower than previous records of 80 years standing) for November over all the southern States (without snow protection) and record cold at many places in the Midwest. Wind damage in the northeastern States was more costly than that in the 1938 hurricanes. *Subject Headings:* **Cyclonic storms, Snowstorms, Synoptic studies.**—*M.R.*

2.6–57 551.515.227:551.501.7(52)

Arakawa, H., **Vertical structure of a mature typhoon.** *Monthly Weather Review*, 78(11):197–200, Nov. **1950.** 3 figs., 5 tables, 8 refs. **MH-BH**—An aerological study of the Kitty typhoon (August 27–Sept. 1, 1949) which was the most destructive to strike the Tokyo area in years. The storm center crossed the Island near Tokyo where a dense network of meteorological stations was operating. Radiosonde and wind aloft observations, including special releases, were obtained at Tokyo and Tatino during the typhoon. Thus a complete picture of the structure of a mature typhoon could be presented. Detailed data as well as charts and theory are included in this brief but excellent paper. *Subject Headings:* **Typhoon structure, Upper air observations, Japan.**—*M.R.*

2.6–58 551.515.227(266.5)

§Thompson, B. W., **The upper-level flow-structure near typhoons.** *Royal Meteorological Society, Quarterly Journal*, 77(332):272–282, April **1951.** 8 figs., 7 refs. **MH-BH**—Flow charts of southwest of N. Pacific at 2000, 5000, 10,000 ft., preceding 19 typhoons, show that the initial small vortices tend to develop at discontinuities between easterlies to N. and westerlies to S. This occurs in the Intertropical Convergence Zone in summer (8 cases) or in equatorial—

N. Pacific Trades discontinuity (3) but they may also form within N. Pacific trades (7, but some of these probably began at discontinuities) or N. Indian westerlies (1). Analyzed 10,000 ft. charts given of several examples. Divergence of N. Pacific trades to W. and N.W. of center is a constant occurrence and warning. *Subject Headings:* **Typhoons, Eastern Pacific.**

2.6–59 551.515.4(43)

Roediger, Geert, **Verbreitete Gewitterbildung durch Warmlufteinschub über Nordwestdeutschland am 3. Juli 1950.** [Widespread thunderstorm formation through a warm air intrusion over northwest Germany on July 3, 1950.] *Annalen der Meteorologie*, 3(11–12):370–374, **1950.** 4 figs., table, 2 refs. **MH-BH**—On July 3, a surface warm front ran ENE between Bremen and Hanover but at 800 mb. warm air upglided further north between two cold air streams, and gave thunder and heavy rain. Development illustrated by radiosonde ascents, upper winds and charts of isotherms and winds at 800 mb. on July 3 and 4. *Subject Headings:* **Thunderstorm formation, Warm fronts, Northwest Germany.**—*C.E.P.B.*

2.6–60 551.515.7:551.509.3

§Kurashima, A. and Arai, Y., **On the structure of cold air (2nd paper).** *Journal of Meteorological Research*, Tokyo, 2(7):209–216, July **1950.** 12 figs. In Japanese, English summary p. (4). **DWB**—An analysis of several synoptic situations in the western Pacific by means of cross sections (both in time and space) showing conditions in the upper troposphere and tropopause at a time when there is an intrusion of a cold dome over the area. Studies of European situations by PALMÉN are discussed and compared with present conclusions regarding inversion or isothermal layer above cold dome. *Subject Headings:* **Upper air analysis, Atmospheric structure, Tropopause, Japan.**—*M.R.*

2.6–61 551.515.8:551.588.2(51)

Jong, P. C., **The Kunming quasi-stationary front.** *Chinese Geophysical Society, Journal*, Nanking, 2(1):87–103, June **1950.** 2 figs., 4 tables, 12 refs. In English, Chinese summary p. 87. **DWB**—A discussion of the origin and characteristics of the Kunming quasi-stationary front and of its influence upon the weather of China. The author considers the role of the orography of southwest China in the formation of the quasi-stationary front, the prevailing winds at the surface and aloft over southwest China in winter, the characteristics and interactions of the air masses over Kunming in winter, the local winter weather in the Red Basin and the Southwest Plateau and the geographical position of the front. Maps with monthly mean number of days with overcast sky and with precipitation in winter and a diagram of the vertical cross section of the Kunming stationary front are presented. *Subject Headings:* **Frontogenesis, Orographic effects, Kunming, China.**—*I.L.D.*

2.6–62 551.515.8(51)

§Chu, P. H., **The frontal waves in spring in China.** *Chinese Geophysical Society, Journal*, Nanking, 2(1):131–143, June **1950.** 4 maps. In English, Chinese summary p. 131. **DWB**—The author analyzes the general trend and rate of movement of fronts and cyclones during the spring in China and the associated weather changes. On the basis of the sources of origin of spring frontal waves during 1935–1937, four types of fronts were found in China: (a) arctic fronts from Novaya Zemlya; (b) polar fronts from Siberia or Outer Mongolia; (c) subpolar fronts transformed from Mediterranean or Central Asian fronts and (d) subpolar fronts originating in China. E-W fronts were found to travel very slowly while N-S fronts very fast. The characteristics of frontal waves as traced on barograms are discussed. *Subject Headings:* **Frontogenesis, China.**—*I.L.D.*

RADIATION AND TEMPERATURE

RADIATION

2.6–63 551.521:551.510.5

Goody, R. M. and Robinson, G. D., **Reviews of modern meteorology—2. Radiation in the troposphere and lower stratosphere.** *Royal Meteorological Society, Quarterly Journal*, 77(332):151–187, April **1951.** 7 figs., 3 tables, numerous refs. and equations. **MH-BH**—A

comprehensive study of all aspects of radiation. Sec. 1 sets out fundamental facts and symbols, and includes a diagram 0.1–50μ of absorption at ground level and 11 km. Sec. 2 deals with amount and nature of incident solar radiation, taking solar temperature as 6000 K. It sets out distribution over earth's surface, discusses earth's albedo, etc. Sec. 3, "Terrestrial radiation," discusses equation of radiation transfer in the atmosphere, radiation charts (Mügge and Möller, Elsasser, Kew chart) and computation of the radiative flux. Sec. 4, "Thermal effects of solar and terrestrial radiation," includes rough estimates of cooling in the atmosphere, absorption of solar radiation, sources and sinks of heat and radiation balance in different latitudes (main sink in upper troposphere, fig. 4). Sec. 5 deals with methods of infrared spectroscopy, Sec. 6, with the absorption and emission of radiation by atmospheric gases (line slopes and widths, band spectra, pressure effects). Sec. 7, "Radiation and the structure of the lower atmosphere," describes various attempts to explain thermal structure in terms of emission and absorption of radiation. Sec. 8 considers scattering by molecules and liquid drops and the value of scatter experiments. *Subject Headings:* **Radiation, Atmospheric structure.**

2.6–64 551.521.11

*Schmidt, F. H., **On the distribution of duration of sunshine in Java.** *Indonesia, Djawatan Meteorologi dan Geofisik, Verhandelingen*, No. 40, **1950.** 18 p. 6 figs., 9 charts, 4 tables, 4 refs. **MH-BH**—This article is a graphical summary and discussion of observations on the duration of sunshine made at 240 stations in Java. The following items are discussed: the relation between duration of sunshine and cloudiness, the annual variation in duration of sunshine, the relation between sunshine and altitude and the daily variation of the duration of sunshine. The duration of sunshine during the east and west monsoon and the change-over periods, yearly means of duration of sunshine and difference in sunshine percentage between morning and afternoon during the monsoon periods are represented on maps. A table giving the location of sunshine recording stations at Java and Madoera is given. *Subject Headings:* **Sunshine duration, Java, Madoera, Indonesia.**—*I.L.D.*

2.6–65 551.521.14:551.576

Piotrowski, Stefan, **Uwagi o swieceniu atmosfery.** [Remarks on the brightness of the atmosphere.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, No. 2–4:39–43, Dec. **1948.** table. English summary p. 43. **DWB**—A theory of radiative transfer in planetary atmospheres, developed by the author, is applied to the problem of scattering from clear or cloudy sky and of reflection from clouds. Observations by Dorno and Schönberg are analyzed and presented in tabular form. Brightness of overcast sky varies from zenith to horizon as $2+3\cos Z$, where Z is zenith distance. *Subject Headings:* **Scattering, Albedo of clouds.**—*From author's abstract.*

2.6–66 551.521.16 551.593.7

Harding, H. G. W. and Lambert, G. E. V., **Colour and brightness of the sky.** *Nature*, London, 167(4246):436–437, March 17, **1951. DWB**—Describes observations of color, brightness and polarization of the sky, observed from 20,000 and 40,000 feet over S.E. England in Sept., over a cloud sheet at 20,000 ft. Table gives luminance and polarization (minimum/maximum luminance through nicol prism). Except near horizon, luminance was proportional to atmospheric pressure. Direct illumination on a surface normal to sun at 40,000 ft., 110,000 lux. *Subject Headings:* **Sky brightness, Polarization.**

2.6–67 551.521.617:523.74

Bruzek, A., **Die veränderlichen Strahlungen der Sonne.** [The variable radiation from the sun.] *Wetter und Leben*, 3(3–4):33–36, March **1951.** 9 refs. **DWB**—An excellent summary of the variable nonvisible solar radiations related to visible solar phenomena, of which sunspots are an index. Classified into: (A) slowly varying (27-day, 11-year cycles) UV (500–1300 A), cm. and meter radio waves and persistent corpuscular radiation; (B) outbursts from chromosphere eruptions, coming almost entirely from sunspot groups, including line UV (1215 A), meter and cm. radio waves, soft cosmic and corpuscular radiation. Intensity of all these at spot maximum is several (up to 100) times that at spot minimum, and equivalent to sun temperatures of 10^6 deg. *Subject Headings:* **Infrared radiation, Sunspots.**—*C.E.P.B.*

TEMPERATURE

2.6–68 551.524.1(42)

Edwards, F., **Low temperatures in Cheshire.** *Weather*, 6(4):127, April **1951.** fig. **DWB**—Thermograph record Dec. 4–5, 1950 shows rapid fluctuations on cold radiation night. *Subject Headings:* **Temperature microvariations, England.**

2.6–69 551.524.2:551.588(438)

*Chatubinska, Aniela, **Izknomale rocznej temperatury w Polsce.** [Isanomalous lines of annual temperature in Poland.] *Annales Universitatis Mariae Curie-Skodowska*, Lublin, 4B(2):17–32, **1949.** 2 figs., 2 tables, 7 refs. English summary p. 23–26. **DLC**—Average annual temperatures for 151 stations in Poland for the period 1881–1930 are used to draw an isothermal chart of Poland. Values used are included in a 5-page tabulation which is summarized by 20 districts. Northwest Poland appears much warmer and southeast Poland much colder than normal for the latitude. Anomalous effect of the maritime, foot hill, mountain and city regions is discussed. *Subject Headings:* **Temperature anomalies, Climatic anomalies, Poland.**—*M.R.*

2.6–70 551.524.31:551.571.31(68)

Vowinckel, Eberhard, **Temperatur und Feuchtigkeit der bodennahen Luftschicht in Pretoria.** [Temperature and humidity in the air layer near the ground in Pretoria.] *Meteorologische Rundschau*, 4(1–2):22–23, Jan.–Feb. **1951.** 3 tables. **MH-BH**—Hourly measurements with Assmann psychrometer were made in Pretoria (25.45°S.) in June at 5 and 130 cm. Amplitude 20.8°C. at 5 cm., 17.7 at 130 cm. Vapor pressure has a half-daily wave. Comparative observations taken over natural vegetation. *Subject Headings:* **Temperature variations, Humidity variations, Pretoria, South Africa.**—*C.E.P.B.*

2.6–71 551.524.33:523.74

Voigts, Heinrich, **Mittlerer Gang der Jahresmitteltemperatur im Sonnenfleckenzyklus.** [Average variation of annual mean temperature in the sunspot cycle.] *Meteorologische Rundschau*, 4(1–2):20–22, Jan.–Feb. **1951.** 2 figs., 2 tables, 6 refs. **MH-BH**—Variations of temperature for 32 places in Europe are tabulated and mostly show an irregular double cycle in the sunspot cycle. They are classified as Atlantic, N. European and Mediterranean types. Results are compared with Baur's curve of difference between abnormalities of faculae and sunspot areas; in the north the variations of temperature are opposite and in the Mediterranean they are parallel to this curve. *Subject Headings:* **Temperature variations, Sunspots.**—*C.E.P.B.*

2.6–72 551.524.7

Variation of upper air temperature with season and latitude. *Meteorological Magazine*, London, 79(941):314–321, Nov. **1950.** 3 figs., 3 tables. **MH-BH**—This preliminary note gives, for 10 stations between Jan Mayen and Nairobi for Jan. and July at pressure levels 100 to 700 mb., mean temperature and range within which 95% of the observations fall. Variability in each month is greatest about 200 mb. The reversal of the annual variation in the stratosphere in lat. 25–40°N. is clearly shown. The percent frequencies of pressures at the tropopause by 20 mb. steps in Dec.–Feb. and June–Aug. are tabulated and illustrated for 14 stations or districts. The increase of scatter with latitude is clearly shown. *Subject Heading:* **Upper air temperatures.**

2.6–73 551.524.3

Koebcke, Fryderyk, **Przebieg temperatury w podziemnym schronie zegarowym Obserwatorium Astronomicznegó U. P.** [Temperature course in the subterranean clockroom of the Poznan University Astronomical Observatory.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, No. 1–4:60–71, **1949.** 1 fig., 4 tables, equations. English summary p. 71. **DWB**—Eight years of mean monthly observations of the temperature of the Shortt clock, installed in the subterranean clockroom of the Poznan University Astronomical Observatory 5.30 meters below the surface of the ground, and corresponding mean monthly temperatures on the surface

are presented. The coefficient of thermal conductivity is determined by comparing the mean annual march of temperature in the clockroom and at the surface. A method of integrating the equation of thermal conductivity, when the temperature at the surface is a function of time, is presented. The general behavior of the observed deviations from the mean annual sinusoid agrees closely with that calculated from the corresponding deviations of the air temperature. *Subject Headings:* **Temperature variations, Surface temperatures, Underground temperatures.**—*I.L.D.*

2.6–74 551.525.4(43)

Wächtershäuser, H., **Harmonische Analyse des mittleren täglichen Temperaturganges in extremen Böden während der Sommer 1947 und 1948 in Giessen.** [Harmonic analysis of the mean daily variation of temperature in bare ground during the summers of 1947 and 1948 in Giessen.] *Meteorologische Rundschau*, 4(1–2):23–24, Jan.–Feb. **1951.** table, 2 refs. **MH-BH**—Temperatures were read 8 times daily at depths of 2.5, 5, 10 and 20 cm. in sand, loess and humus during the dry summer of 1947 and the cool, moist summer of 1948. From these the constants of diurnal variation of temperature conductivity in each layer were calculated. *Subject Headings:* **Thermal gradient, Soil temperatures, Giessen, Germany.**—*C.E.P.B.*

2.6–75 551.526.6(261.3)

Dietrich, Günter, **Über systematische Fehler in den beobachteten Wasser- und Lufttemperaturen auf dem Meere und über ihre Auswirkung auf die Bestimmung des Wärmeumsatzes zwischen Ozean und Atmosphäre.** [On systematic errors in the observed water and air temperatures at sea and their effect on the determination of the heat exchange between ocean and atmosphere.] *Deutsche Hydrographische Zeitschrift*, 3(5–6):314–324, **1950.** 9 figs., 23 refs. German and English summaries p. 314–315. **DWB**—A comparison of observations at 3 lightships in Skagerrak and W. Baltic with ships' observations in surrounding 1° squares showed water temperature observed by ships as 0.3–0.5°C. too high in winter and 0.1–0.2°C. too low in summer; excess greatest by day. This is due to radiation, heat exchange between water sample and air, and thermometer lag (for low temperatures). Each effect is analyzed (month, water-air temperature, air temperature). Radiation effect depends on latitude, others universally applicable. There are corresponding errors in temperature difference water —air. *Subject Headings:* **Sea temperatures, Skagerrak, Baltic Sea.**—*C.E.P.B.*

2.6–76 551.526.6:551.509(261.3)

Frank, Hans, **Über die Rolle der Wassertemperaturen im Wetter der westlichen Ostsee.** [On the role of the water temperature in the weather of the western Baltic.] *Annalen der Meteorologie*, 3(11–12):375–376, **1950. MH-BH**—Sailors in W. Baltic recognize two seasons, cold and warm water, irrespective of synoptic situation. In cold-water season the weather is quiet, wind much weaker than geostrophic, and irregular, no low cloud and good visibility. In warm-water season the weather is uncertain and squally. *Subject Headings:* **Sea temperatures, Marine influences, Baltic Sea.**—*C.E.P.B.*

2.6–77 551.526.6(261)

Rodewald, Martin, **Einige Bemerkungen zur Wassertemperatur vor dem Westausgang der Biskaya.** [Some remarks on the water temperature west of the Bay of Biscay.] *Annalen der Meteorologie*, 3(9–10):303–312, **1950.** 10 figs., 4 tables, 8 refs. **MH-BH**—The mean monthly surface temperatures at the weather ship site (47°N., 15°W., then 45°N., 16°W.) are computed from punch cards at Hamburg (ca. 1900–1939) and from Bohnecke's "Meteor" Atlas and the U. S. World Atlas; agreement generally good. The monthly deviations Oct. 1946–Aug. 1950 vary from +1.8 (Aug. 1949) to −0.1°C. (Aug. 1950). The pressure distributions in these two extreme cases are discussed, also a sudden fall by 3°C. in Oct. 1949 and a rapid rise in June 1949. Finally, the recent rise of air temperature in N.W. Germany is connected with the mean air transport from 45°N.16°W. in Oct.–Dec. 1949 and the sunshine excess at Hamburg. *Subject Headings:* **Sea temperature, Punched card analysis, Bay of Biscay.**—*C.E.P.B.*

PRESSURE AND WIND

PRESSURE

2.6–78 551.582:551.54(485)

*Högberg, L., **Lufttrycket i Sverige 1901–1930.** [Air pressure in Sweden 1901–1930.] *Sweden, Meteorologiska och Hydrologiska Institut, Meddelanden, Ser. A*, No. 2, **1950.** 20+p. 2 figs., 7 tables, 4 plates. English summary p. 10–11. **MH-BH**—One of a series of studies of the various climatic elements for the "normal period" (1901–1930) recommended by the I.M.O. (Washington, 1947). The mean values of air pressure for the period of 1901–1930 from selected Swedish stations are presented in tables and graphs and compared with corresponding data for the period of 1866–1895. Monthly mean pressures are shown on charts of Norway and Sweden and isobars drawn to 0.5 mb. intervals. Also isobars of pressure difference between 1866–1895 and 1901–1930 for each month show increasing southwesterly flow and higher temperatures in winter during the latter period. *Subject Headings:* **Atmospheric pressure, *Normal* period (1901–1930), Sweden.**—*W. N., M.R.*

2.6–79 551.461.2:551.543

Kawabata, Yukio, **Harmonic analysis of solar annual and solar semi-annual tide in Japan.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 28(6):201–211, June **1950.** 3 figs., 3 tables. In English, Japanese summary p. 210–211. **DWB**—Most of the paper is occupied with the geographical variation of harmonic constants. Variations of barometric pressure are found to be only a partial explanation. *Subject Headings:* **Atmospheric tides, Pressure variations.**—*C. E. P. B.*

TURBULENCE

2.6–80 551.551(4)

Scorer, R. S., **Clear-air turbulence over Europe.** *Weather*, 6(2):59–60, Feb. **1951. DWB**—Account of a joint meeting of Royal Aeronautical and Meteorological Societies on Dec. 14, 1950 which was opened by G. S. Hislop. Vertical accelerations much greater than g/2 are encountered over Europe in strips 50 miles wide and 2–3000 ft. deep, in stable lapse rate. No explanation can be given. *Subject Headings:* **Turbulence, Europe.**

2.6–81 551.551

Sheppard, P. A., **Atmospheric turbulence.** *Weather*, 6(2):42–49, Feb. **1951.** 4 figs., 8 refs. **DWB**—A good, popular introduction. On every scale of air motion from global circulation downwards, a spectrum of motions is superposed which ends in molecular dissipation. Turbulence is defined as comprising all superposed motions of smaller scale than that under consideration. The transfer of momentum, heat and moisture by turbulence is discussed; it is partly but not always proportional to the gradient of the quantity. Present trends in research are illustrated by vertical and horizontal diffusion and boundary layer turbulence. *Subject Headings:* **Turbulence, Atmospheric motion.**

2.6–82 551.551:551.556.2:632.1

IUdin, M. I., **Vliianie lesnych polos na turbulentnyĭ obmen i optimal'naia shirina polos.** [Influence of the shelter belts on turbulent exchange and the optimal width of the belts.] *Akademiia Nauk, SSSR, Doklady*, 71(4):655–658, April **1950.** 6 refs., 5 equations. **DLC**—A shelter belt reduces not only the wind speed but what is more important for agriculture, it reduces the turbulent exchange by breaking up the big eddies and forming many small random eddies. Experiments made in 1949 by the Div. of Applied Meteorology of the Central Geophysical Observatory (Leningrad), in connection with theoretical calculations, lead to the conclusion that for belts of sparse trees the optimum width would be from 8 to 25 meters. *Subject Headings:* **Turbulent exchange, Shelter belts.**—*M.R.*

WIND AND VERTICAL MOTION

2.6–83 551.55:551.588.2(52)

*Kato, T., **An investigation of wind in Osaka.** *Journal of Meteorological Research*, Tokyo, 2(9):287–293, Nov. **1950.** figs., table. In Japanese, English summary p. (8). **MH-BH**—A

statistical study of wind direction and speed in various parts of Osaka. Fourteen charts are presented, showing local variations in air flow and speed of wind which seem to be due rather to topography than to artificial influences. The strongest winds are found in the center of the city. *Subject Headings:* **Wind distribution, Topographic effects, Osaka, Japan.**—*M.R.*

2.6–84 551.554(52)

Mitani, I., **Report of wind observation on Kawaguchi wireless tower (1st Report).** *Journal of Meteorological Research*, Tokyo, 2(10):310–318, Nov. **1950.** 5 figs., 4 tables, 4 refs., equations. In Japanese, English summary p. (9). **MH-BH**—Observations were made at 9 heights (51.3 to 312 m.) from Dec. 1942–Dec. 1944. Tables give diurnal variation of wind and temperature. Change of wind speed with height nearly proportional to speed in any season, and is related to lapse rate. Diurnal variation varies with height and upper wind speed; reversal occurs between 91–171 m. in spring and summer and 50–65 m. in autumn and winter. *Subject Headings:* **Wind observations, Japan.**—*C.E.P.B.*

2.6–85 551.555.3(988)

Rossmann, Fritz, **Über den Föhn auf Spitzbergen und Grönland.** [On the föhn in Spitsbergen and Greenland.] *Zeitschrift für Meteorologie*, 4(9):257–262, Sept. **1950.** table, 12 refs. **MH-BH**—Föhn is attributed to an air current descending from föhn-wall cloud, cooled by evaporation of scattered droplets. The so-called föhn of Spitsbergen, shown by kite ascents to be only a few hundred meters deep, warms adiabatically and is not a true föhn. It is a local wind blowing off north slopes in Sept.–May; sea breezes prevail on S. slopes in summer. In Greenland, valley föhn often occurs on the steep slopes of the inland ice, with moist adiabatic warming due to drift snow blown off the inland ice. *Subject Headings:* **Föhn winds, Spitsbergen, Greenland.**—*C.E.P.B.*

2.6–86 551.556.2:632.1(43)

Arzt, Theodor, **Windschutz durch Anbaumassnahmen.** [Wind protection by cultivation arrangements.] *Meteorologische Rundschau*, 4(1–2):28–29, Jan.–Feb. **1951.** fig., 2 tables. **MH-BH**—Describes an investigation at Giessen of a method of providing wind protection for a weak crop (maize) by combining it with a protective crop (soya). This effected a considerable reduction of wind speed. Maximum temperature was lowered and relative humidity raised, another advantage in a dry climate. *Subject Headings:* **Wind protection, Agricultural meteorology, Giessen, Germany.**—*C.E.P.B.*

2.6–87 551.557:551.501.7

Sawyer, J. S., **The movement of jet streams and the wind hodograph.** *Meteorological Magazine*, London, 79(942):357–358, Dec. **1950.** fig. **MH-BH**—The straight section of the hodograph is prolonged. A perpendicular from this to the origin represents the direction of motion of the jet axis and, roughly, its speed. Author concludes that the movement of a jet stream perpendicular to its axis is closely related to the component in this direction of the wind within the jet. *Subject Headings:* **Jet stream, Upper air winds, Hodographs.**

2.6–88 551.557(559,267,54)

*Venkiteshwaran, S. P., **Winds at 10 kms. and above over India and its neighbourhood.** *India, Meteorological Dept., Memoirs*, 28, Pt. 2, **1950.** p. 55–120+. 4 figs., 72 charts, tables, 15 refs. **DWB**—After brief discussion of sources of data, methods of observation and computation, and the upper wind circulation charts which are appended; the main features of the upper wind circulation over India, the Persian Gulf and Indian Ocean are analyzed by months, and the variation of wind speed with height up to 29 km. is discussed. Winds, deduced from cirrus movements, are mentioned (charts include insets showing such movements) and the zonal circulation charts summarized. Pilot balloon data from 62 stations (1920–1947) are used to determine winds. Excellent charts show winds and mean air flow by months at 10, 12, 14, 16, 18 and 20 km.; graphs show mean seasonal winds in 5 regions of India from surface up to 32 km., zonal components of gradient winds and tropopause according to BJERKNES and from observations along 78°E (summer and winter), respectively, and total number of observations

by months at 10, 15 and 20 kms. Detailed data are given in tables for each station. *Subject Headings:* **Upper winds, Zonal circulation, Persian Gulf, Indian Ocean, India, Middle East.**—*M.R.*

2.6–89 551.558.2:551.501.45

Arizumi, N., **A diagrammatic method of computing vertical motion in the atmosphere and its applications.** *Geophysical Magazine*, Tokyo, 22(2):131–141, Nov. 1950. 14 figs., table, 4 refs., 9 equations. In English. **MH-BH**—Based on *Panofsky's single-station technique*, the author has worked out a simplified scheme whereby the sense and amount of vertical motion can be quickly computed from the wind hodograph for a station. It is assumed that motions are adiabatic and that when the wind rotates clockwise there is ascending motion and vice-versa. Rules are derived for motions in various parts and levels of cyclones, for the motion of cyclones with respect to areas of vertical motion and for computing rainfall amount from the vertical velocity. *Subject Headings:* **Vertical motion, Upper air winds, Nomograms, Rainfall amount.**—*M.R.*

2.6–90 551.558.2:797.5

Ivans, W. S., Jr., **Navigation as applied to cross-country soaring.** *Navigation*, 2(7):212–216, Sept. 1950. Append.: **Notes on soaring at stratosphere levels.** 1 fig. **DLC**—Brief description of ridge, wave and thermal soaring. The appendix describes soaring in standing waves in mountain country which give very strong updraft to over 30,000 and possibly 60,000 ft. *Subject Headings:* **Vertical currents, Gliders.**—*C.E.P.B.*

2.6–91 551.558.21

Gilman, C. S. and Weiss, L. L., **A numerical solution for irrotational flow over a mountain barrier.** *American Geophysical Union, Transactions*, 31(5), Pt. 1:699–706, Oct. 1950. 4 figs., 2 tables, 6 refs., 7 equations. **MH-BH**—The "relaxation method" is applied to Pockels' differential equation of flow up to 10 km. over a given barrier 3 km. high of sine curve profile with specified boundary conditions. It gives much smaller vertical velocities than those computed by Pockels', but larger than computed by J. Bjerknes' exponential method. *Subject Headings:* **Vertical velocities, Orographic effects.**—*C.E.P.B.*

2.6–92 551.558.21

Scorer, R. S., **Forecasting the occurrence of lee waves.** *Weather*, 6(4):99–103, April 1951. 1 fig., table, 2 refs., equations. **DWB**—Standing lee waves behind a hill can only occur in laminar flow if l^2 exceeds k^2 at low levels but is less than k^2 at higher levels. Here $l^2 = g\beta/U^2 - U''/U$, where $\beta = d\theta/\theta dz$ (θ is potential temperature) and U = horizontal wind component across the hill; k^2 is given by wave length $= 2\pi/k$. The most important factor is an increase of U with height; the second height derivative U'' can be ignored. An example is given. An inversion is not necessary but helps to make waves visible in cloud. The longer the ridge the larger the wave train. *Subject Headings:* **Forecasting lee waves, Orographic effects.**

AQUEOUS VAPOR AND HYDROMETEORS

WATER VAPOR AND CLOUDS

2.6–93 551.574.1

Best, A. C., **The size of cloud droplets in layer-type cloud.** *Royal Meteorological Society, Quarterly Journal*, 77(332):241–248, April 1951. 6 tables, 10 refs. **MH-BH**—The maximum size of droplets on salt nuclei, time required to grow from radius 0.75μ to 1 − 50μ, corresponding fall distance and average radius in a cloud are calculated, assuming various sized nuclei, temperatures and degrees of supersaturation. Rate of growth is compared with that calculated by Howell. The calculated radii reached before droplet is removed from the cloud by turbulent diffusion or gravity agree well enough with the results of observation. *Subject Heading:* **Cloud physics.**

2.6–94 551.574.1

Ludlam, F. H., **Structure of shower clouds.** *Nature*, London, 167(4242):254–256, Feb. 17, 1951. fig., 4 refs., equation. **DWB**—Describes results of further examination of growth of droplets and crystals in cumulus. Growth of a droplet is slow for radius below 30μ, but above that radius increases rapidly in proportion to its velocity relative to smaller drops, concentration of liquid water and density of droplet distribution. In many clouds large droplets, rather than ice crystals, cause the bulk of the precipitation. Graph shows growth of large droplets in cloud with base at 900 mb. and 10°C. Author suggests that the most generally profitable procedure in rain-making would be spraying large droplets or large hygroscopic nuclei into cloud base. *Subject Headings:* **Cloud physics, Artificial precipitation.**

2.6–95 551.574.42

Fujisan. Ibukiyama and Iwateyama Weather Station, **Report on the investigation of Nebelfrost (2nd Report).** *Journal of Meteorological Research*, Tokyo, 2(9):259–286, Nov. 1950. 24 figs., 15 photos, table. In Japanese, English summary p. (7)–(8). **MH-BH**—A complete analysis of relation between weather conditions and icing during 19 cyclonic storms (Oct. 1938–March 1941) on the basis of data obtained at 3 mountain observatories in Japan. Icing was collected on various diameters of pipes and the size of cloud particles, the type of ice (soft or hard rime), density of ice, wind, pressure, temperature, synoptic conditions and other factors were recorded and are shown in graphs. Photographs show various ice formations in the columns and microstructure of ice. Most icing occurred in the warm sector near the front or when a cyclone passed through the Sea of Japan. *Subject Headings:* **Rime, Icing, Mountain meteorology, Mt. Fuji, Japan.**—*M.R.*

2.6–96 551.574.42:625.1

Ice formation on conductor rails. *Meteorological Magazine*, London, 80(943):24–25, Jan. 1951. 2 photos. **DWB**—Describes an investigation in progress to show relation of temperature of rails to temperature and humidity in screen which will help in forecasting icing. *Subject Headings:* **Icing forecasts, Transportation facilities.**

2.6–97 551.574.7

Ice accretion. *Meteorological Magazine*, London, 79(942):348–351. Dec. 1950. 6 refs. **MH-BH**—Report of discussion on Oct. 6, 1950, on the results of the Harvard-Mount Washington Icing Research Project. *Subject Headings:* **Icing, Cloud physics.**

2.6–98 551.576:551.511:532.59

Scorer, R. S., **Billow clouds.** *Royal Meteorological Society, Quarterly Journal*, 77(332):235–240, April 1951. 1 fig., 10 equations. **MH-BH**—Discusses the origin of billow clouds; single rows of globular clouds persisting 2–10 min. They cannot be due to convection cells or unstable waves; they are attributed to long parallel vortices in the statically unstable shearing layer between stable motions above and below. *Subject Heading:* **Cumulus clouds.**

2.6–99 551.576.11:551.509.3(469)

Hyler, W. C., **Stratus formation and non-frontal stratus at Lisbon airport.** *Portugal, Serviço Meteorológico Nacional, Memórias*, No. 8, [N. D.] 11 p. 7 figs. From a lecture given on 16 Oct. 1950. **DWB**—A humorous and philosophical, but accurate exposition of the general problem of stratus formation and forecasting (anywhere) and of the local influences producing stratus at Lisbon airport. Associated lapse-rates, air flow, synoptic patterns and water temperatures discussed and illustrated by simple schematic diagrams and charts. Two types of stratus are important at Portela Airport (Lisbon); the southwest type and the north type. *Subject Headings:* **Stratus clouds, Cloud forecasting, Portela Airport, Lisbon.**—*M.R.*

2.6–100 551.576.1:551.558.2

McCaffery, W. D. S., **Lee eddies and cloud formation.** *Meteorological Magazine*, London, 80(943):21–22, Jan. 1951. 1 fig. **DWB**—Eddy cloud observed at precipitous, leeward edge of Horton Plains, a plateau 7000 ft. high in Ceylon. Attributed to condensation

in warm, moist air drawn up by eddies from plains below. *Subject Headings:* **Cloud formation, Orographic effects, Lee eddies, Ceylon.**

2.6–101 551.576.11

Taft, Paul S., **Cumulonimbus in New Mexico.** *Weather*, 6(2):40, Feb. **1951.** 1 plate. **DWB**—Three striking photos taken at short intervals at Albuquerque showing development. *Subject Headings:* **Cumulonimbus formation, Albuquerque, New Mexico.**

2.6–102 551.576.11:551.593.652(481)

§Wehner, Hans, **Das Auftreten hoher Perlmutterwolken über Südnorwegen.** [The occurrence of high mother-of-pearl clouds over southern Norway.] *Zeitschrift für Meteorologie*, 4(9):262–268, Sept. **1950.** 5 figs., 8 refs. **MH-BH**—Mother-of-pearl clouds occurred on evening of Jan. 30, 1944. Assumed height 23–27 km. The synoptic situation is shown at the surface, 500, 225 and 96 mb. The relative topography shows a deep tongue of very warm air over Norway; earlier examples were probably similar. Author regards these lenticular clouds as "obstacle" clouds due to the air flow from NNW over the Scandinavian mountains and local warming of ozone layer forming an inversion about 25 km. The paper was written in 1947; an appendix discusses work since then. *Subject Headings:* **Nacreous clouds, South Norway.**—*C.E.P.B.*

2.6–103 551.576.12

Champion, D. L., **Cloud cap over Sandray, Outer Hebrides.** *Meteorological Magazine*, London, 80(943):19–21, Jan. **1951.** 2 figs. **DWB**—Sketch of a lenticular cloud said to be a sure warning of rain in Barra. It forms with a S or SE wind blowing over a long stretch of water. *Subject Headings:* **Cloud formation, Weather lore, Hebrides, Scotland.**

2.6–104 551.576.3(431)

Knepple, R., **Die Bewölkung im Bereich der Ostseeküste Mecklenburgs.** [Cloudiness in the region of the Baltic coast of Mecklenburg.] *Zeitschrift für Meteorologie*, 5(1):14–26, Jan. **1951.** 4 figs., 5 tables, 8 refs. **MH-BH**—A detailed, statistical analysis of cloud amounts at a number of stations. Tables and diagrams give monthly and daily means and frequencies (0–2, 2–5, 5–8, 8–10 tenths), diurnal variation, comparison of coast with interior and Munich, and cloud-wind roses for Rostock. *Subject Headings:* **Cloudiness, Mecklenburg, Baltic Coast.** —*C.E.P.B.*

RAINFALL

2.6–105 551.577.21(41/2)

Glasspoole, J., **Rainfall over Great Britain and Northern Ireland during the decade 1940–49.** *Royal Meteorological Society, Quarterly Journal*, 77(332):307–308, April **1951.** 1 fig., 2 tables. **MH-BH**—In continuation of previous maps, rainfall 1940–49 is expressed as percent of mean 1881–1915 (regional average 97.7). Decadal values quoted back to 1820. *Subject Headings:* **Rainfall distribution, Great Britain, Northern Ireland.**

2.6–106 551.577.31:551.558.2:551.557.2(73)

Bleeker, W. and Andre, M. J., **On the diurnal variation of precipitation, particularly over central U. S. A., and its relation to large-scale orographic circulation systems.** *Royal Meteorological Society, Quarterly Journal*, 77(332):260–271, April **1951.** 7 figs., 14 refs. **MH-BH**—Discusses night rainfall maximum over a large area of central plains of the U.S. in summer, mainly in thundery showers. This is attributed to a large scale vertical circulation over a broad plain with sloping mountains on either side. Cooling and contraction of air over the plain causes a flow from the slopes, resulting in convergence over the plain and divergence in the upper air (mapped at 4000, 10,000, 18,000 ft.). By day the opposite occurs. These ideas are confirmed by a study of changes of divergence over the U.S. at 6 hour intervals and by thunderstorm frequency per ¼ day. A similar night maximum of thunder is found in South America. *Subject Headings:* **Diurnal precipitation variations, Orographic effects, Midwest, United States.**

2.6–107 551.577.35

Dunbabin, T., **The Australian winter rain-belt has swung north.** *Weather*, 6(1):27–28, Jan. 1951. **DWB**—During 1950, Tasmania had a deficit of rainfall; Queensland and center of Australia an excess. *Subject Headings:* **Rainfall variations, Climatic variations, Australia.**

2.6–108 551.577.37

Fletcher, Robert D., **Hydrometeorological development and practices in the United States.** *Weather*, 6(4):108–113, April 1951. 2 figs., 2 refs. **DWB**—Describes method of preparing "depth-duration-area" curves of great rainstorms by meteorological analysis. The maximum surface dew point at 1000 mb. is used as a "moisture index" and the precipitable water is calculated using saturation adiabatics (graphs given). These and the curves give maximum possible precipitation. In mountain regions calculations are based on moisture loss between ingoing and outgoing air. Effect of strong winds on lake levels is discussed and illustrated, using Lake Okeechobee as an example. *Subject Headings:* **Excessive precipitation, Hydrometeorology, United States.**

2.6–109 551.577.38:551.556.4:63(492)

van Waterschoot van der Gracht, Willem A. J. M., **Klimaat-en landverdroging; natuurlijke en menschelike invlorden.** [Climate and drought; natural and artificial influences.] Amsterdam, A. de Lange, 1944. 58 p. photos. **DLC**—As a result of disastrous sand or dust storms which occurred in the Netherlands in the spring of 1942, the author made an intensive study of weather, crop and vegetative conditions in Holland during that season and compared them with the much more extensive but similar conditions in the Great Plains during the 1930's. The results of this study are treated briefly in the present volume (which was published after the author's death in 1943) which also includes a general discussion of wind erosion and climatic changes. *Subject Headings:* **Drought, Agricultural meteorology, Climatology, Netherlands.**—*M.R.*

2.6–110 551.577.6:629.13

Rain damage; studies with aircraft exterior plastics give new erosion data. *Aviation Week*, 52(16):24–26, April 17, 1950. **DLC**—The effect of rain drops impinging on the leading edges of airplanes was studied for the benefit of the U. S. Air Force under varying conditions of speed of airplane, rainfall intensity, temperature, drop size, angle of attack and type of material covering the wing. Speed has the greatest effect, the erosion increasing as the *6th to 8th power of the speed.* Thus at 500 mph. the erosion is over 16,000 times as great as at 100 mph. Above 60° angle, erosion is extensive but below 60° is much less. No variation found between 40° and 80°F. Larger drops and more intense rainfall increase erosion quite rapidly. *Subject Headings:* **Raindrop damage, Erosion, Aviation.**—*M.R.*

2.6–111 551.578.1

Davies, D. A., **Tropical rainfall from cloud which did not extend to the freezing level.** *Meteorological Magazine*, London, 79 (942):354, Dec. 1950. table. **MH-BH**—Near Mombasa on Oct. 5, 1950 rain was seen (from an airplane) falling from cumulus with tops 10,500–11,000 ft.; no anvil. Temperatures at 10,500 ft.—dry bulb 40°F., wet bulb 38–39. *Subject Headings:* **Rain from nonfreezing clouds, Cloud physics.**

2.6–112 551.578.11 551.578.41(52)

Matsui, H., **On the content of hydrogen peroxide of atmospheric precipitates.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 27(12):380–381, Dec. 1949. 2 refs. In Japanese, English summary p. 40. **MH-BH**—Amount of H_2O_2 in precipitation at Kanagawa varied from .08 to .86 mg./l., maximum June, minimum Jan., varying with UV radiation, and attributed to action of UV on water particles. *Subject Headings:* **Rainwater analysis, Atmospheric composition, Snow analysis, Japan.**—*C.E.P.B.*

HYDROMETEOROLOGY

2.6–113 551.579:551.49(02)

*Leĭvikov, M. L., **Meteorologiia, gidrologiia i gidrometriia.** [Meteorology, hydrology and hydrometry.] Moscow, Gosizdat, 1949. 471 p. 149 figs., 44 tables, 156 equations.

MH-BH—As the author is concerned mainly with hydrological surveys and forecasts for the benefit of agriculture and reclamation, the main part of this textbook is devoted to discussion and illustration of instruments, equipment, formulas and tables (of an engineering type) for use in calculating actual or expected surface runoff from rain, showers or snow. There are no bibliographic references, nor is any mention made of work done by meteorologists or hydrologists outside of the USSR. The first part takes up the historical development of meteorology and hydrology and the hydrologic cycle, or water balance, of the earth and of individual river basins. Part two discusses the meteorological elements (pressure, temperature of soil and air, humidity, rainfall, snow cover, wind and evaporation) their observation, and weather forecasting. Part three goes very thoroughly into surface hydrology and forecasting. Part four, which comprises the last half of the text, is concerned with measurements and determinations of runoff in small and large basins, going into great detail regarding formulas for estimation of stream flow on the basis of rainfall or snow melt, using various schemes and constants. The statistical treatment of data for significance is explained and illustrated in detail. Forms of all types for recording hydrologic data, charts of rainfall, snow and runoff for the USSR, tables of parameters for estimating shower or snow runoff, examples of calculations from nomograms and tables, and diagrams of scores of instruments or devices are included. *Subject Headings:* **Meteorology, Hydrology, Textbooks.**—*M.R.*

2.6–114 551.579.2

Gerdel, R. W. and Mansfield, C. E., **The use of radioisotopes in research on snow melt and runoff.** Western Snow Conference, Proceedings, 18th Annual Meeting, Fort Collins, Colo., Oct. **1950.** p. 5–17. 11 figs., 2 tables, 3 refs. **MH-EH**—*Subject Headings:* **Snow melt, Runoff.**

2.6–115 551.579.4

Holtan, H. N. and Kirkpatrick, M. H., Jr., **Rainfall, infiltration, and hydraulics of flow in runoff computation.** *American Geophysical Union, Transactions*, 31(5), Pt. 1:771–779, Oct. **1950.** 11 figs., 9 refs. **MH-BH**—Infiltration capacity of soil is shown graphically in surface inches per 0–60 minutes for soil types from old permanent pasture (2.8 in./hr.) to bare, crusted ground (0.4 in./hr.). Excess above this is runoff. Lag in runoff is shown by detention curves for various watershed areas up to 50 acres. Exemplified by storm of June 13, 1939, at Chatham, Va. *Subject Heading:* **Runoff.**—*C.E.P.B.*

2.6–116 551.579.4(09)(52)

Kurashige, K., **Analysis of the historical flood records in "Nanbuhan."** *Journal of Meteorological Research*, Tokyo, Vol. 2, Suppl. No., p. 96–104, Aug. **1950.** 9 figs., 9 tables, 3 refs., 2 equations. In Japanese, English summary p. 109. **DWB**—Flood records in "Nanbuhan" since 1650 were subjected to periodogram analysis and periodicities of 24 and 35 years were found. A relation to the 11-year sunspot cycle was also found. *Subject Headings:* **Floods, Periodicities, History, Japan.**—*C.E.P.B.*

2.6–117 551.579.4:551.577.37(782)

Potter, W. D., **Effect of rainfall on magnitude and frequency of peak rates of surface run-off.** *American Geophysical Union, Transactions*, 30(5):735–751, Oct. **1949.** 13 figs., 15 tables, 5 refs. **MH-BH**—Rainfall and runoff (1939–1946) on watersheds W-8 and W-3 in Nebraska, found to be representative of Yarnell's 30-year average, were compared for 30 min. storms of various intensity. Runoff depends on state of ground and three conditions were tabulated—maximum, intermediate and minimum. Several statistical indexes are determined and charted, showing effect of intensity and amount of rainfall and number of excessive storms on magnitudes of runoff. The results can be adjusted to apply to other watersheds. *Subject Headings:* **Runoff, Rainstorms, Nebraska.**—*C.E.P.B.*

2.6–118 551.579.4(52)

Yoshida, S., **On the time of water rise in the upper part of river Kitakami.** *Journal of Meteorological Research*, Tokyo, Vol. 2, Suppl. No., p. 92–96, Aug. **1950.** 4 figs., 1 graph. In Japanese, English summary p. 109. **DWB**—The time interval between heaviest rainfall in

Morioka and highest water gage at Meiji Bashi (fig. shows locality) averaged 6.0 hours from 1932 to 1942 and 4.2 hours from 1942 to 1948. *Subject Headings:* **Runoff, Japan.**—*C.E.P.B.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

2.6–119 551.582(43)

Hennig, Richard, **Das Wetter in Deutschland.** [The weather in Germany.] Stuttgart, Franckh, [1947]. 84 p. 1 ref. **DLC**—A small, popular book consisting mainly of a description of the weather of Germany. It is concerned with the *phenomena* of weather rather than with the *physical processes* underlying them. The characteristics of pressure, air temperature, cloudiness and solar radiation, precipitation, hail, sleet, thunderstorms, winds and storms in Germany are described. Special attention is given to a description of the extreme weather conditions and of the extreme variations of the meteorological elements that have occurred in Germany over the period for which meteorological observations are available. *Subject Headings:* **Climatology, Meteorological elements, Germany.**—*I. L D.*

2.6–120 551.582(81)

*Peixoto Machado, Floriano, **Contribuição ao estudo do clima do Rio Grande do Sul.** [Contribution to the study of the climate of Rio Grande do Sul.] Rio de Janeiro, Serviço Gráfico do Instituto Brasileiro de Geografia e Estatística, **1950.** 91 p. maps, tables. **MH-BH**—A carefully prepared and attractively edited monograph based on over 45 years of record at stations evenly distributed throughout this southernmost province of Brazil. The discussion, tables and charts go beyond the usual presentation of isotherms and isohyets. Analysis is made of duration frequencies of dry and wet spells, cold and warm periods; the extreme cases of drought, cold waves or heat waves are cited. Frequency of ice and the height of the snow line, duration of sunshine, special winds, thunderstorms, humidity and other elements are discussed on the basis of available data. No radiation, upper air or synoptic data was available, however. *Subject Headings:* **Climatology, Rio Grande do Sul, Brazil.**—*M.R.*

2.6–121 551.582.1(962)

France. Établissements Français de l'Océanie, Service Météorologique, **Resumé des observations faites en 1948.** [Summary of observations made in 1948.] Papeete, Tahiti, **1950.** 25+leaves. 1 map, tables. **MH-BH**—Includes monthly and annual (1948) data for 8 stations in French Oceania, including detailed data for the Central Observatory in Tahiti; a list of 18 papers published by the service between 1934 and 1943; summary of weather for each month; means of various elements observed for 1935–1948; map of region of Island of Tahiti, and also one showing location of stations; frequency of various elements (rainfall, clouds, hail, thunderstorms, visibility, winds at the surface and winds aloft). *Subject Headings:* **Climatological data, Tahiti, French Oceania.**—*M.R.*

2.6–122 551.582.1(596)

*French Indochina. Service de la Statistique Générale, **Annuaire Statistique de l'Indochine.** Vol. 10, 1941–1942. Hanoi, **1945.** p. 1–18. chiefly tables. Vol. 11, 1943–1946. Saigon, **1948.** p. 1–22. chiefly tables. (Gouvernement Générale de l'Indochine, Direction des Services Économiques). **DLC**—Chap. 1 of each volume gives tables of monthly and annual mean temperatures and total rainfall, number of days with rain and mean relative humidity for from 6 to 21 meteorological stations in Indochina. *Subject Headings:* **Climatological data, French Indochina.**—*M.R.*

CLIMATIC CHANGES

2.6–123 551.583:551.510.42

Gentilli, J., **Present-day volcanicity and climatic change.** *Geological Magazine*, London, 85(3):172–175, May–June **1948.** 3 figs., 3 tables, 3 refs. **DLC**—A criticism of paper by Fuchs and Paterson (*see item* No. 2.6–124) wherein temperature anomaly charts for the world (based on Clayton's World Weather Records) are given for the years immediately following the eruption of Krakatoa, Katmai and the Andean eruptions of 1921, respectively. The

conclusion reached on the basis of these data is that no consistent or significant anomalies can be discovered in the temperatures at either nearby stations, or throughout the world in the year following an eruption. *Subject Headings:* **Climatic variations, Volcanic dust.**—*M.R.*

2.6–124 551.583:551.510.42

Fuchs, V. E. and Paterson, T. T., **The relation of volcanicity and orogeny to climatic change.** *Geological Magazine*, London, 84(6):321–333, Nov.–Dec. **1947.** 6 figs., 15 refs. **DLC**—The effect of widespread and simultaneous eruptions of volcanoes or of associated earth movements is thought to be the cause of climatic changes. During the Pleistocene there were rainy periods in East Africa and glaciation elsewhere, which might be explained on the basis of such theories as advanced by Humphreys (1913) and C. E. P. Brooks (1926). A double maximum pluvial, such as is found in Kenya, could be explained on the basis of the general effect of volcanic dust in the stratosphere producing changes in general circulation which would not be simultaneous with local changes due to upheaval of land mass or local screening. Evidence from Kenya is examined in detail by Fuchs in the first part of this paper and mechanism for producing the ice periods taken up in the second part by Paterson. *Subject Headings:* **Climatic changes, Volcanic dust, Orogeny, Kenya, East Africa.**—*M.R.*

2.6–125 551.583.2:551.524:634.9

Schove, D. Justin, **Tree rings and summer temperature, A.D. 1501–1930.** *Scottish Geographical Magazine*, 66(1):37–42, **1950.** 2 figs., table, 20 refs. **MH-BH**—Five series of tree ring (pine and spruce) records made in Norwegian and Swedish Lapland are analyzed to reveal periods of high and low summer temperatures. Different species for different sections were used in order to cross-date and remove some of the objections raised on dating from one record or one species alone. Mean growth from year to year from 1800 to 1900 shown graphically in comparison with mean temperature anomaly of growing season at Trondheim, Norway. On the basis of this comparison summer temperature anomalies are extrapolated back to 1500. Similar work done in Scotland, England and elsewhere is cited. *Subject Headings:* **Dendrochronology, Summer temperatures, Climatic variations.**—*M.R.*

2.6–126 551.583.3

Brooks, C. E. P., **Legacy of the Ice-age.** *Meteorological Magazine*, London, 79(941):321–323, Nov. **1950.** 2 refs. **MH-BH**—Review of "Pleistocene Research" report of the Committee of Interrelations of Pleistocene Research (*Geological Society of America, Bulletin*, 60, 1949). *Subject Heading:* **Climatic changes, Glacial periods.**

2.6–127 551.583.3:551.581

Büdel, Julius, **Die Klimaphasen der Würmeiszeit. (Beiträge zur Geomorphologie der Klimazonen und Vorzeitklimate IV.)** [The climatic phases of the Würm ice period. (Contribution to the knowledge of the geomorphology of the climatic zones and paleoclimatology IV.)] *Die Naturwissenschaften*, 37(19):438–449, Oct. **1950.** figs., numerous refs. **DWB**—Graph shows estimated mean annual temperature during various geologic periods (from 6 million to 1000 B.C.) beginning with the warm Pliocene (30°C.) and proceeding through 6 ice ages when mean temperature was about 8°C. Lengthy discussion followed by 7 conclusions, with special emphasis on evidence from vegetation of conditions during last Pleistocene (Würm or Wisconsin) ice period. *Subject Headings:* **Climatic changes, Climatic zones, Paleoclimates.** —*M.R.*

MICROCLIMATOLOGY

2.6–128 551.584:58

Baum, Werner A., **Ecological use of meteorological temperatures.** *Science*, 113(2934):333–334, March 23, **1951. DLC**—The author comments on the article by Went (*see item* No. 2.1–175 in Jan. 1951 *Meteorological Abstracts*) and stresses the importance of considering the radiative conditions in the environment of plants as well as air temperature and the need for measuring the air temperature in the lower six feet above the ground level, in the study of plant ecology. *Subject Headings:* **Microclimatology, Plant ecology.**—*I.L.D.*

2.6–129 551.584.3

Parry, D. A., **Microclimate close to the ground.** *Nature*, London, 167(4237):73–74, Jan. 13, **1951.** table, 2 refs. **DLC**—To obtain temperatures of animals and plants, author measured equilibrium temperatures of a small black metal disk suspended over different types of surface. *Subject Heading:* **Microclimatology.**

2.6–130 551.584

*Thornthwaite, Charles Warren, **Micrometeorology of the surface layer of the atmosphere.** *Johns Hopkins University, Laboratory of Climatology, Seabrook, N. J., Interim Report* No. 12, Dec. 31, **1950.** 91 p. 15 figs., 3 tables, 9 append. **DWB**—Simultaneous hourly observations were made of air and soil temperatures from −40 to 640 cm., of vapor pressure from 2.5 to 640 cm. and of wind velocity from 80 to 640 cm. above the ground. The profiles on air temperature, humidity, wind velocity; maximum and minimum air temperatures and soil temperature; solar radiation; ground water levels; precipitation and potential evapotranspiration obtained during the period from October to December 1950 are presented. A detailed description of the three-cup airways anemometer contacts, which were redesigned to operate with a solenoid counter and an electronic relay which registers each revolution of the anemometer shaft, is given and the contacts are illustrated by photographs; a diagram of the counter circuit is given. An overwater installation to measure wind velocity and temperature gradient profiles over a body of water and temperature profiles below the water surface is described and illustrated. *Subject Headings:* **Micrometeorology, Meteorological instruments.** —*I.L.D.*

2.6–131 551.584(771)

†*Wolfe, John Nicholas, Wareham, Richard T. and Scofield, Herbert T., **Microclimates and macroclimate of Neotoma, a small valley in central Ohio.** *Ohio Biological Survey, Bulletin*, 41, 8(1), Oct. **1949.** 267 p. 97 figs., 85 tables, 223 refs. Summary p. 239–246. **DWB.** Review in *Geographical Review*, 41(1):158–159, Jan. **1951. DLC**—A detailed study of the microclimates and macroclimates of the Neotoma Valley which had been conducted for five years (1939–1944) by means of several hundred instruments in continuous operation. Observations were made in diverse habitats and measurements were made of temperatures near the substrate beneath the leaf litter and five feet above the substrate, of soil temperatures at a depth of 9–12 inches; of plant temperatures, of light intensities, precipitation, evaporation from atmometers, fluctuations in soil moisture and of vapor pressure. Also, phenological data were collected. The authors present a discussion of the relationship between weather and climate and of the relationship between microclimates and biotic activities. The various habitats are illustrated with photographs and the data are presented in graphical and tabular form. (*Same item* as No. 2C-193 in March 1951 *Meteorological Abstracts*.) *Subject Headings:* **Microclimatology, Neotoma Valley, Ohio.**—*I.L.D.*

BIOCLIMATOLOGY

2.6–132 551.586:551.508.98(471)

*Lunelund, Harald, **Messung der Abkühlungsgrösse in Südfinnland mit dem Katathermometer.** [Measurement of the cooling factor in South Finland with the katathermometer.] *Societas Scientiarum Fennica, Commentationes Physico-Mathematicae*, Helsinki, 8(3), **1948.** 26 p. 4 figs., 13 tables, 15 refs., 13 equations. **DLC**—Various formulas and instruments for determining the biologically effective temperature are described. These attempt to integrate the effect of wind, radiation, temperature and humidity or combinations of these. The formulas of Vincent, Linke and Büttner and the Davos frigorimeter and Hill katathermometer are especially considered. Measurements made in 1944 and 1945 at Dalsvik and Helsinki, Finland, with a katathermometer are summarized in various ways and compared with Davos frigorimeter measurements made at Helsinki in 1926–27 and 1930–31. Some observations were made in sunshine in open country, some in shade or near buildings and some indoors with various types of heating. Both wet and dry cooling power were determined. *Subject Headings:* **Climatology, Cooling power, Katathermometers, Finland.**—*M.R.*

2.6–133 551.586:612:523.78

Kamiyama, K., Maruyama, H., Yoshida, F., Nakajima, A., Kanazawa, I., and Koyama, Y., **The variation of salivary pH resulting from the solar eclipse.** In: Report of solar eclipse observation May 9, 1948. *Geophysical Magazine*, Tokyo, 19(3–4):170–174, Dec. 1949. 4 figs., 2 tables, 6 refs. In English. **DWB**—The pH of the salivary secretion of six persons was measured during the eclipse of May 9, 1948. A diagram of the apparatus used and the data obtained are given. Only one subject showed a significant (significant at 5% level) variation in pH at the time of the eclipse. *Subject Headings:* **Solar eclipses, Physiology, Japan.**—*I.L.D.*

2.6–134 551.586:612

Spangenberg, W. W., **Bemerkungen zur Frage der Schwülegrenze.** [Remarks on the question of the sultriness limit.] *Meteorologische Rundschau*, 4(1–2):24–28, Jan.–Feb. 1951. fig., table, 3 refs. **MH-BH**—Author examines the generally accepted limit of an equivalent temperature of 56°C. and finds that this is only accurate with an air temperature near 25°, varying with temperature. He compares related temperature and relative humidity given by sultriness limits of 14.08 mm. vapor pressure, 56° equivalent temperature, 24° and 25° effective temperature, and 19° dew point and also discusses cooling power as a measure of sultriness. *Subject Headings:* **Comfort zones, Cooling power.**—*C.E.P.B.*

2.6–135 551.586:612

Vereshchagin, N. K. and Boldyrev, V. B., **Izmenenie vegetativnykh protsessov v organizme pri prebyvanii v vysokogornykh usloviiakh.** [Changes in some vegetative functions of an organism in high mountain climates.] (In Trudy El'brusskoĭ Ekspeditsii Akademii Nauk, SSSR, i Vsesoiuznogo Instituta Eksperimental'noĭ Meditsiny 1934 i 1935. [Reports of the Elbrus Expedition 1934 and 1935.] Moscow, 1936. p. 419–440. 12 tables, 22 refs. Summary in English p. 439–440. [*Ak. Nauk, SSSR, Komissiia po izucheniiu stratosfery*, Tom II.]) **DLC**—Frequency of pulse rate, blood pressure and respiration in a recumbent position, length of time the breath can be held, the orthostatic test, pulse rate after muscular work and red dermographism were investigated in 6 subjects at elevations of 2250 m., 4250 m. and 5350 m. The vegetative functions are altered noticeably at elevations of 2200 m. The variability of the vegetative functions is greater at moderate elevations than at higher altitudes. After prolonged stay at high altitudes the changes become more marked and show no tendency to return to the initial level. The authors stress the importance of individual variations. *Subject Headings:* **Mountain meteorology, Physiological climatology, Elbrus Expedition, U.S.S.R.**—*I.L.D.*

2.6–136 551.586:63

Tiscornia, José, **La aplicación del método de los equivalentes estadistico de Azzi y su comparación con el cálculo estadístico de las correlaciones en los problemas de Ecologia Agrícola.** [The application of Azzi's equivalent method and comparison with statistical correlations in the problems of agricultural ecology.] *Revista Meteorológica*, 9(33):66–70, April 1950. fig. **MH-BH**—The author challenges the validity of Dr. Azzi s arguments in defense of his method of meteorological "equivalents," which the latter maintains is more useful in agricultural ecology than the method of statistical correlations. This method of equivalents (not fully described in this article) would appear to make use of mean frequencies without regard for deviations. *Subject Headings:* **Agricultural climatology, Plant ecology.**—*R.S.Q.*

2.6–137 551.586:63:681.177(6)

Walter, A., **Research scheme on climatic data in relation to agriculture.** *East African Agriculture and Forestry Research Organization, Annual Report* 1949, [1950]. p. 41. **DA**—A brief summary of work completed and projected by the author on the effect of radiation diffusivity. It was found that by using the mean temperatures, the daily range and vapor pressure measured in a standard screen, a close approximation to the incoming solar radiation can be determined. Future work includes punched card analysis of soil moisture, radiation (derived as above) and rainfall records for 300 East African stations to compute the balance

between soil moisture or evaporation and rainfall. *Subject Headings:* **Agricultural meteorology, Energy exchange, Punched card analysis, East Africa.**—*M.R.*

2.6–138 551.586:634.9(471)

†*Hustich, I., **The Scotch pine in northernmost Finland and its dependence on the climate in the last decades.** *Acta Botanica Fennica*, 42, **1948.** 75+p. 14 figs., 6 maps, 7 diagrs., 27 tables, biblio. p. 72–75. **DA**—A large amount of detailed measurements made over 10 to 60 years on the reproduction, growth, length of needles, variations in the forest limit, the flowering, fruit formation, etc. of forests in northern Finland are analyzed and correlated with climatic factors. The Scotch pine is especially sensitive in the Arctic to temperature changes from year to year, although in arid regions it is more sensitive to rainfall anomalies. Changes in snow cover, wind, frozen ground, forest fires and human activity complicate the analysis. *Subject Headings:* **Climatic variations, Forest limits, Finland.**—*M.R.*

APPLIED CLIMATOLOGY

2.6–139 551.587(7)

Haarlaender, Hans, **Meteorologie des freien Luftmeeres. Bericht über E. Ekhart: Das Aeroklima Nordamerikas.** [Meteorology of the free air. Review of E. Ekhart: The aeroclimate of North America.] *Zeitschrift für Meteorologie*, 4(7–8):229–234, July–Aug. **1950.** 8 figs., 20 refs. **MH-BH**—Based on *Monthly Weather Review*, 1931–41. Under "space-time temperature distribution" discusses mean meridional temperature profile (thermo-isopleths winter, summer), height of tropopause, vertical temperature gradient, zonal distribution, horizontal temperature field (2–8 and 17–20 km.) and annual variation. Pressures and winds over ocean and continent are similarly discussed. *Subject Headings:* **Upper air climatology, North America.**—*C.E.P.B.*

2.6–140 551.587(72) 551.582(72)

*Mills, Richard H. and Hull, Blanche B., **Weather summary, Mexico; for use with naval air pilots.** Washington, D. C., U. S. Navy Hydrographic Office and U. S. Weather Bureau, **1949.** 220 p. figs., charts, maps, tables. H. O. Publication No. 532. **DWB**—In addition to the usual surface and upper air climatic data, charts, and discussion which is included in each part of this series, the present volume contains many original charts such as histograms of monthly precipitation, frequency of ceiling heights, visibility and hydrometeors; resultant winds and mean isobars at 10,000 and 20,000 feet by seasons; annual variation of height of the freezing level at radiosonde stations; charts showing the time-altitude variations in air flow and humidity up to 10 km.; atmospheric stability to 17 km. indicating height of inversion and variation in upper and lower tropopause (at Tacubaya and Mazatlán) and a discussion of these data. *Subject Headings:* **Climatology, Aeronautical climatology, Mexico.**—*M.R.*

2.6–141 551.588.2:551.582(494.1)

Jessen, O., **Fernwirkungen der Alpen.** [The effects of the Alps at a distance.] *Geographische Gesellschaft in München, Mitteilungen*, Vol. 35, **1949/50.** p. 7–67. 8 figs., 18 refs. **DLC**—A comprehensive article on the geological, climatic and cultural effects of the Alps on the regions for a great distance to the north. The visibility conditions affecting the distance at which one can see the Alps are discussed in the first chapter. Fog, mirage, city smoke and unusual visibility are considered. On rare occasions peaks are visible up to 250 km. Climatic effects on the various zones in and near the Alps are considered in Chap. 6. Emphasis is placed on *föhn* and *stau* effects (on rainfall, cloudiness, sunshine, temperature, humidity and wind). Effects on water supply are considered in Chap. 7, and effects of radiation conditions on plant and animal growth in Chap. 8. Effects on human activity are taken up in the remaining chapters. *Subject Headings:* **Orographic effects, Mountain meteorology, Climatology, Alps.**—*M.R.*

SYNOPTIC CLIMATOLOGY

2.6–142 551.589.1:551.581:551.513.1

Gordon, A. H., **Seasonal variation of the axes of low-altitude pressure and divergence patterns over the ocean.** *Royal Meteorological Society, Quarterly Journal*, 77(332):302–306,

April 1951. 3 figs., 2 tables. **MH-BH**—Author calculated mean latitudes of N. and S. anticyclones and doldrum belt in Atlantic, Indian, W. and E. Pacific Oceans for each month and the correlations between those in the same oceans (mostly high+). Similarly, mean latitudes and magnitudes of belts of maximum convergence of surface winds were calculated from wind vectors. *Subject Headings:* **Synoptic climatology, Atmospheric circulation, Tropical meteorology.**

2.6–143 551.589.5(269)

***§Observations on Antarctic whaling ground (1948–1949).** *Oceanographical Magazine*, Tokyo, 1(3):142–173, Sept. 1949. 11 figs. (incl. synoptic charts), tables. In English. **MH-BH**—A detailed report on weather and oceanographic conditions observed in the Antarctic between Dec. 1948 and March 1949 in the area just south of Australia and New Zealand. Storm tracks; analyzed synoptic charts for certain outstanding situations; barograph, anemograph and hygrograph traces; studies of frontal movements; forecasts for the whaling fleet; statistics of weather elements; comparison with other years; water temperature surveys; salinity; density currents; ice conditions; etc. are presented in tables or charts and discussed. *Subject Headings:* **Synoptic climatology, Oceanography, Antarctic Seas.**—*M.R.*

MISCELLANEOUS APPLICATIONS

VISIBILITY

2.6–144 551.591.31/2(42)

Davis, N. E., **Fog at London Airport.** *Meteorological Magazine*, London, 80 (943):9–14, Jan. 1951. 2 figs., table, ref. **DWB**—An extensive table gives for each hour and month the 4-year frequencies of visibilities less than 220, 440, 880 and 1100 yards. Figures for 220 and 1100 yards shown graphically. Length of night, elevation of sun, vapor pressure and smoke pollution are the important factors; the last depends on wind direction relative to London. *Subject Headings:* **Visibility, Fog, London.**

OPTICAL PHENOMENA

2.6–145 551.593.11

Crain, C. M. and Gerhardt, J. R., **Some preliminary studies of the rapid variations in the index of refraction of atmospheric air at microwave frequencies.** *American Meteorological Society, Bulletin*, 31(9):330–335, Nov. 1950. 7 figs., 11 refs., 2 equations. **MH-BH**—Rapid moisture variations in the atmosphere are measured by the dielectric constant or index of refraction of atmospheric air at microwave frequencies. The theoretical basis for this procedure is discussed. The apparatus used to measure small changes in refractive index as a function of atmospheric moisture compares the resonant frequency of a cavity through which air is drawn with the constant resonant frequency of a sealed reference cavity. An auxiliary bead thermistor and heated platinum wire were used for comparing variations in refractive index with those of air temperature and wind speed. A comparison of simultaneously recorded fluctuations of microwave index of refraction and air temperature shows that air temperature and moisture variations are positively correlated. This positive correlation is shown to be a function of soil moisture, elevation and insolation. No immediate correlation was found between refractive index and wind speed. *Subject Heading:* **Atmospheric refraction.**—*I.L.D.*

2.6–146 551.593:22

Gold, Ernest, **What occurred during the Transfiguration?** *Weather*, 6(4):128, April 1951. **DWB**—Supports suggestion in *Weather* of April 1949, that Biblical account refers to a "glory." Meteorological explanations suggested for other miracles. *Subject Heading:* **Optical phenomena.**

ELECTRICAL PHENOMENA

2.6–147 551.594:629.135

Gondet, H., **Électrisation des avions en vol.** [Electrification of airplanes in flight.] *La Météorologie*, 4th Ser., No. 19:143–152, July–Sept. 1950. fig., equations. French, English

and Spanish summaries p. 143. **DWB**—A discussion of the theory of the electric field in the atmosphere, followed by a brief treatment of the electrometer which is used in studies of charges on and around airplanes in flight. Charges produced by the airplane itself and by the cloud are then considered and then the mechanism of discharge discussed. Finally, the natural and artificial dissipation of charges by ionization of various types and by other methods is treated. *Subject Headings:* **Electrical phenomena, Aeronautical meteorology, Electrometers.** —*M.R.*

2.6–148 551.594.12:551.521.64

Aliverti, Giuseppina, **Radioattività atmosferica.** [Atmospheric radioactivity.] *Rivista di Meteorologia Aeronautica*, 10(2):3–9, April–June **1950.** 1 fig., 1 table. Italian, French, English and German summaries p. 3. **MH-BH**—Three causes of ionization of air are considered: cosmic radiation, radioactivity from the soil and radioactivity in the air. The relative importance of the three is discussed and quantitative estimates, together with measurements made for the ionization based on soil emanations and other factors, are given. Results obtained by several investigators tabulated. Effect of weather conditions, turbulence, altitude, etc. also discussed. *Subject Headings:* **Ionization, Radioactivity in the atmosphere.**—*M.R.*

2.6–149 551.594.12(98)

Meek, Jack H., **Sporadic ionization at high latitudes.** *Journal of Geophysical Research*, 54(4):339–345, Dec. **1949.** 12 figs. Abstract p. 339. **MH-BH**—Sporadic ionization is here defined as changing very rapidly and erratically. It was investigated by multifrequency vertical beams at Baker Lake, Canada. Four types are described in E and F layers. Assuming that they are due to ionospheric clouds, speeds vary on the average from 400 km./hr. at 100 km. to 1200 at 300 km. Maximum frequency about 57°N lat. *Subject Headings:* **Ionization, Polar regions.**—*C.E.P.B.*

2.6–150 551.594.25:551.578.11

Chalmers, J. Alan, **The origin of the electric charge on rain.** *Royal Meteorological Society, Quarterly Journal*, 77(332):249–259, April **1951.** 4 figs., table, refs., 16 equations. **MH-BH**—Sets out a quantitative theory of the observed electric charge on rain on the basis that the field giving rise to the point discharge is first set up and the raindrops are charged by the ions from the point discharge. On reasonable assumptions, including neglect of convection currents, as to ion capture, this is quantitatively possible. The best fit is given by zero potential gradient at about 800 meters and an effective separation of discharge points by 6–14 m. It is suggested that precipitation remains solid, on the average, down to 800 m. and separation of + and − charges operates down to this level. It usually gives − charge on falling drops but can give +. *Subject Headings:* **Electricity of precipitation, Cloud physics.**

2.6–151 551.594.25

Thunderstorm electrification. *Meteorological Magazine*, London, 80(943):15–18, Jan. **1951.** **DWB**—Abstract and discussion by G. D. Robinson of 3 papers by Ross Gunn (1947–1950). T. W. Wormell described two unpublished researches at Cambridge on electrical charges on individual raindrops showing effect of capture of ions, and radar investigation of vertical structure of thunderstorms showing intense echoes from near cloud base. J. A. Chalmers, F. J. Scrase and R. F. Jones also described recent researches. *Subject Headings:* **Electricity of precipitation, Thunderstorm structure.**

RADIO METEOROLOGY

2.6–152 551.594.7

Bremmer, H., **Voortplanting van radiogolven in de troposfeer.** [Propagation of radio waves in the troposphere.] *Nederlands Tijdschrift voor Natuurkunde*, 16(11):275–280, Nov. **1950.** 4 figs., 2 equations. **DLC**—Discussion of *super refraction, radio ducts* and other aspects of radio wave reflection and propagation in the stratosphere is illustrated by schematic diagrams and examples. *Subject Heading:* **Radio propagation.**—*M.R.*

2.6–153 551.594.7

Perlat, A., **Effet des conditions météorologiques sur la propagation des ondes radioélectriques à fréquence elevée.** [Effect of meteorological conditions on the propagation of radioelectric waves of high frequency.] *Journal Scientifique de la Météorologie*, 2(8):101–107, Oct.–Dec. **1950.** 3 figs. French, English and Spanish summaries p. 101. **MH-BH**—Test conducted in 1948 and 1949 between Paris and Clacton on Sea (England) show that anomalous reception of 2m. radar signals depends on the presence of a subsidence inversion over the area and the absence of any fronts along the course. Best reception (at distance of 400 km.) occurs when pressure is above 1013 mb. and dew point above 9°C. Surface observations and radiosonde data were analyzed for 52 cases during the year when long-distance reception was possible. *Subject Headings:* **Radio transmission ducts, Anomalous radio propagation.**—*M.R.*

2.6–154 551.594.7:551.515.8

Whitaker, H., **Weather and television.** *Weather*, 6(2):63, Feb. **1951. DWB**—Best reception behind a cold front, worst in front of slow-moving or stationary warm front or occlusion. *Subject Headings:* **Television reception, Fronts.**

ACOUSTICAL PHENOMENA

2.6–155 551.596.1 551.46

Veldkamp, J., **Geluidvoortplanting in oceaan en atmosfeer.** [Acoustical propagation in the ocean and atmosphere.] *Nederlands Tijdschrift voor Natuurkunde*, 16(11):281–289, Nov. **1950.** 6 figs., 4 refs., equations. **DLC**—Charts showing possible sound trajectories in the sea and atmosphere with varying density conditions should prove useful for calculations of sound propagation. Data on propagation in the atmosphere, based on the Oldebroek (1932) and Helgoland (1947) explosion observations, are used to calculate temperatures in the stratosphere and anomalous paths and times of travel. *Subject Headings:* **Anomalous sound propagation, Oceanography, Acoustical sounding.**—*M.R.*

SUNSPOTS

2.6–156 523.74

McNish, A. G. and Lincoln, J. V., **Prediction of sunspot numbers.** *American Geophysical Union, Transactions*, 30(5):673–685, Oct. **1949.** 6 figs., 9 tables, 13 refs. **MH-BH**—A method is given for predicting annual sunspot numbers, based on the mean sunspot cycle, a year in advance and a correction factor proportional to the observed departures of the cycle in progress from the mean cycle. It is shown statistically that sunspot data preceding 1834 cannot be comparable with those since 1834. *Subject Heading:* **Sunspots.**—*C.E.P.B.*

2.6–157 523.74

Nicholson, Seth B., **Large sunspots.** *Smithsonian Institution Annual Report*, 1947. Washington, D. C., **1948.** p. 173–176. 2 plates, 1 table. Reprint available. **MH-BH**—Gives list of 27 sunspots of area 2500 millionths of solar hemisphere since 1874 (none 1874–1891). Largest March/April 1947, 4300 millionths. Brief remarks on recurrence and on ionospheric and magnetic effects. *Subject Heading:* **Sunspots.**—*C.E.P.B.*

2.6–158 523.74(09)

Schove, D. Justin, **The earliest dated sunspot.** *British Astronomical Association, Journal*, A1(1):22–25, Dec. **1950.** 13 refs. **DWB**—Records made in China (4th century after Christ), Greece (middle of the 4th century B. C.), Russia (1365 and 1371) during forest fire smoke, Japan (854), Korea (1151) and China (A. D. 188, 28 B. C. and 165 B. C.). *Subject Headings:* **Sunspots, History.**—*M.R.*

GLACIOLOGY AND ICE

2.6–159 551.579.3:551.311.12(436)

Fritsch, Volker, **Einige geoelektrische Untersuchungen auf österreichischen Gletschern.** [Geoelectrical investigations on Austrian glaciers.] *Geofisica Pura e Applicata*, 17(3–4):210–213, Oct.–Dec. **1950.** 4 figs. English summary p. 210. **MH-BH**—About 1938 attempts were

made to measure the thickness of glaciers in Austria by high frequency radio sounding techniques; since 1946 the specific resistance of glacial rivulets was measured to determine the composition and amount of surface water. Effects of rainfall and temperature on runoff are shown in relation to resistance as measured by this method. *Subject Headings:* **Geoelectric soundings, Glacial runoff, Austria.**—*M.R.*

2.6–160 551.311.12(494)

†Mercanton, P.-L., **Sur le développement de la glaciologie suisse.** [On the development of Swiss glaciology.] *Geofisica Pura e Applicata*, 17(3–4):204–209, Oct.–Dec. **1950.** 15 refs. **MH-BH**—Data on the variations in Swiss glaciers have been published since 1880 by various organizations, but only since 1923 have extensive and intensive observations been made. In late 1949 it was determined that of 100 Swiss glaciers, 93 were diminishing and 5 increasing; whereas in 1950 only one was increasing. During the past 10 years physical and chemical experiments and seismic soundings on glaciers have been made by the Commission Helvétique des Glaciers. Many important studies and publications are described and cited. *Subject Headings:* **Glaciology, Switzerland.**—*M.R.*

2.6–161 551.311.12

Polli, Silvio, **Stato attuale del ghiacciaio del Mandrone (Adamello) e fattori climatici.** [Actual state of the glacier of Mandrone (Adamello) and the climatic factor.] *Geofisica Pura e Applicata*, 17(3–4):224–229, Oct.–Dec. **1950.** 5 figs., 2 refs. Italian and English summaries p. 224. **MH-BH**—Phenomenal changes in the Mandrone glacier are due to the rapid retreat and decrease in thickness of the front of the glacier. Photographs show some of the new features such as new lakes, occluded ice-tongues, U-shaped valleys and decrease in water-level of old lakes. The consequences of higher temperatures in future years on the climate and water supply of the locality are briefly mentioned. *Subject Headings:* **Glacial ablation, Topographical effects, Italy.**—*M.R.*

2.6–162 551.583.1:551.311.12(45)

Vanni, Manfredo, **Le variazioni recenti dei ghiacciai italiani ed i loro fattori meteorologici.** [Recent variations of the Italian glaciers and their meteorological controls.] *Geofisica Pura e Applicata*, 17(3–4):230–233, Oct.–Dec. **1950.** 1 table, 5 refs. English summary p. 230. **MH-BH**—The Italian Glaciological Committee has made a study of 80 glaciers and of climatic conditions in Italy and has come to the conclusion that glacial shrinkage in the last 25 years is due to less snowfall in winter rather than to hotter summers. In the last 4 years (1946–50), however, hotter summers have augmented the retreat. *Subject Headings:* **Glacial ablation, Climatic variations, Italy.**—*M.R.*

2.6–163 551.311.12(05)

Zeitschrift für Gletscherkunde und Glazialgeologie (Innsbruck). Edited by R. v. Klebelsberg. Innsbruck, Schillerstrasse 13, Austria. Published by Universitäts-Verlag Wagner. 15½x23 cm. Price of Vol. 1 is 78 schilling. First issue (Vol. 1. Pt. 1 Aug. 1949, Pt. 2 Aug. 1950). Vol. 1 includes 2 parts and 365 p. **MH-BH**—A periodical devoted to knowledge of former and present glaciers. It includes original articles and communications, reports on glacier surveys and summaries of conferences, biographical notes and an extensive section of long, detailed reviews. Annotated bibliographies form a special feature; the two published are: "pollen analysis" and "A general classified list (*see items* 2.2–137 and 2.2–139 in Feb. 1951 *Meteorological Abstracts*). The individual articles of meteorological interest are abstracted here separately. *Subject Headings:* **Glaciology, Periodicals.**—*C.E.P.B.*

2.6–164 551.311.181(43)

Nusser, Franz, **Die Eisverhältnisse des Winters 1949/50 an den deutschen Küsten zwischen Ems und Oder.** [Ice conditions of the winter of 1949/50 on the German coasts between Ems and Oder.] *Deutsche Hydrographische Zeitschrift*, 3(5–6):335–341, **1950.** 3 figs., 2 tables. German and English summaries p. 335–336. **DWB**—Ice conditions moderate (normal). *Subject Headings:* **Sea ice, German coasts.**—*C.E.P.B.*

2.6–165 551.311.181(984)

Nusser, Franz, **Die Vereisung des Lilliehöökfjordes (Spitzbergen) in den Jahren 1941/42 und 1942/43.** [Ice conditions in Lillihook Fjord (Spitsbergen) in the years 1941/42 and 1942/43.] *Deutsche Hydrographische Zeitschrift*, 3(5–6):286–293, **1950.** 1 fig. German and English summaries p. 286. **DWB**—Chart shows dates of freezing. Tide channel closed by mid-April. Thaw or break up begins early in June. *Subject Headings:* **Sea ice, Lillihook Fjord, Arctic Ocean.**—*C.E.P.B.*

2.6–166 551.311.182:551.48(485)

Melin, Ragnar, **Undersökningar vid Sveriges Meteorologiska och Hydrologiska Institut över vattendragens isförhållånden.** [Investigation of the Swedish Meteorological and Hydrological Institute on ice conditions on lakes and rivers.] *Sweden, Meteorologiska och Hydrologiska Institut, Meddelanden*, Ser. D, No 1, **1947.** 50 p. 23 figs., 4 tables, 6 refs. In Swedish, English summary p. 47–49. **MH-BH**—Investigations and observations are being conducted by the Institute on the thickness, temperature, type, cover (snow or water), consistency, duration, etc. of ice on the lakes, rivers and reservoirs to determine the effect of periodic depletion of the reservoirs under present regulation policies. This monograph contains many excellent diagrams, graphs and photographs illustrating the relation between weather elements and ice conditions in Sweden. *Subject Headings:* **Ice, Lakes and rivers, Hydrography, Sweden.**—*M.R.*

PART II. CLIMATOLOGY OF THE MIDDLE EAST AND CENTRAL ASIA. A SELECTED, ANNOTATED BIBLIOGRAPHY

By: *Harris P. Kramer*

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1861

2F–1 551.506(584.515)

*Schlagintweit-Sakünlünski, Hermann Rudolf Alfred von, Schlagintweit, Adolph von and Schlagintweit, Robert von, **Results of a scientific mission to India and high Asia, undertaken by order of the East India Co., 1854–58.** Leipzig and London, **1861–1866.** 4 vols. **DLC, NN**—Vol. I. **Astronomical determinations of latitudes and longitudes and magnetic observations . . .** Vol. II. **General hypsometry of India, the Himalayas, and western Tibet . . .** Vol. III. **Route-book of the western parts of the Himalayas, Tibet and Central Asia and geographical glossary from the languages of India and Tibet . . .** Vol. IV. **Meteorology of India; an analysis of the physical conditions of India, the Himalayas, western Tibet, and Turkistan . . .** (536 p. maps, diagrams, tables, refs. Parts 3 and 4 of this volume deal with High Asia.) Temperature stations are discussed; observational data included. Isothermal profiles are treated at length, and tables given. *Subject Headings:* **Temperature, Observational data, Central Asia, Tibet, Turkistan.**

1869

2F–2 551.582(5)

*Schlagintweit-Sakünlünski, Hermann Rudolf Alfred von, **Reisen in Indien und Hochasien. Eine Darstellung der Landschaft, der Cultur und Sitten der Bewohner, in Verbindung mit klimatischen und geologischen Verhältnisse. Basirt auf die Resultate der wissenschaftlichen Mission von Hermann, Adolf und Robert von Schlagenweit in 1854–1858.** [Journeys in India and Central Asia. A determination of agriculture, of culture and location of population, in relation to climatic and geologic conditions. Based on the results of the scientific mission of . . .] 4 Vols. Jena, Hermann Costenoble, **1869–1880.** maps, figs., tables. **DLC, NN**—Vol. I. **Indien.** Vol. II. **Hochasien.** [High Asia.] **Pt. I. Der Himalaya von Bhutan bis Kashmir.** [Himalayas from Bhutan to Kashmir.] Vol. III. **Hochasien, Pt. II. Tibet; zwischen der Himalaya- und der Karakorum-Kette.** [Tibet; between the Himalayas and the Karakorum Range.] Vol. IV. **Hochasien, Pt. III. Ost-Turkistan und Umgebungen.** [East Turkistan and neighboring regions.] Vol. IV, **Wissenschaftliche Beilage, II** (p. 449–552): **Temperatur, Isothermen und klimatische Zonen in Indien und in Hochasien.** [Temperature, isotherms and climatic zones in India and in Central Asia.]—Surveys of temperature stations in the entire region are given along with observational data, discussion and isotherm charts. Insolation and effects of humidity are also taken up. *Subject Headings:* **Climatology, Temperature, Insolation, India, Ceylon, Tibet, Himalayas, Eastern Turkistan, Central Asia.**

1870

2F–3 551.582(567)

*Hann, Julius, **Klima von Mesopotamien.** [Climate of Mesopotamia.] *Österreichische Gesellschaft für Meteorologie, Zeitschrift,* 5:499–504, **1870.** tables. **NN**—Brief discussion and tables are given. Tables give monthly averages of temperatures, cloudiness, rainy days, thunderstorms and seasonal winds for 1861 in Baghdad. Some similar data given for Samawa on the Euphrates for 6 months 1861–62. *Subject Headings:* **Climatology, Baghdad, Samawa, Mesopotamia, Iraq.**

1872

2F–4 551.582.1(53)

von Maltzan, Heinrich, **Über das Klima des westlichen und südlichen Arabiens.** [On the climate of western and southern Arabia.] *Petermanns Geographische Mitteilungen,* 18:330–332, **1872. DLC, NN**—Climatic characteristics of the region are briefly discussed. No observational data included. *Subject Headings:* **Climatology, Arabia.**

1876

2F–5 551.586(58)

Schlagintweit-Sakünlünski, Hermann Rudolf Alfred von, **Klimatischer Charakter der pflanzengeographischen Regionen Hochasiens mit vergleichenden Daten über die angrenzenden Gebiete.** [Climatological character of the geographic plant regions of Central Asia with some data on the bordering regions.] *Munich, (K.) Bayerische Akademie der Wissenschaften, Math.-Phys. Klasse, Abhandlungen*, 12(3):197–243, **1876.** Unchecked. *Subject Headings:* **Bioclimatology, Central Asia.**

1877

2F–6 551.582(58)

Voeĭkov (Woeikoff), Aleksandr Ivanovich, **Klima von Innerasien.** [Climate of inner Asia.] *Österreichische Gesellschaft für Meteorologie, Zeitschrift*, 12:369–382, **1877.** table, refs. **NN**—Survey is made of mountainous and eastern part of central Asia after observations taken during PRZEWALSKI's first expedition. Some tabulated data are included. *Subject Headings:* **Climatology, Central Asia.**

1880

2F–7 551.555.8(53)

Russell, Herbert H., **On a sandstorm at Aden, July 16th, 1878.** *Royal Meteorological Society, Quarterly Journal*, 6:48–50, 1879–80. **DWB, NN**—Brief descriptive account with discussion. No data. *Subject Headings:* **Sand storms, Aden.**

1887

2F–8 551.553.21 551.552(267)

Dallas, William Liscombe, **Memoir on the winds and monsoons of the Arabian Sea and North Indian Ocean.** Calcutta, **1887.** 45 p. 10 plates, tables, equations. **DWB, NN**—Prevailing winds of Arabian Sea and the adjacent part of the Indian Ocean are considered; first, as indicated by actual observations; and second, as the author speculates on their probable place in the general circulation of southern Asia. Charts show atmospheric pressure, wind direction and force for each month at numerous points in region. *Subject Headings:* **Winds, Monsoons, Atmospheric circulation, Arabian Sea, North Indian Ocean, Southern Asia.**

1888

2F–9 551.542 551.552(479.2)

*Rykatschew, Mikhail A., **Die Vertheilung der Winde und des Luftdruckes am Caspischen Meere.** [The distribution of winds and of atmospheric pressure on the Caspian Sea.] *Akademia Nauk, SSSR, Meteorologicheskiĭ Sbornik*, 11(2), **1888.** 97 p. 6 charts, numerous tables. **DLC, NN**—Observations used in this analysis of winds of the Caspian region are obtained from the Central Physical Observatory (U.S.S.R.) records and the meteorological and magnetic annual edited by KUPFFER. Nineteen stations are included, 10 on the shores of the Caspian. Wind directions and velocities are discussed as well as atmospheric pressure conditions over the area. Extensive data and charts, drawn to show wind directions by seasons and averaged, are presented. *Subject Headings:* **Winds, Atmospheric pressure, Caspian Sea, U.S.S.R.**

1889

2F–10 551.582(55)

Gotthardt, Wilhelm, **Studien über das Klima von Iran. I.** [Study on the climate of Iran. I.] Inaug.-Diss.—Marburg, **1889.** 28 p. tables, numerous refs. **DWB, NNA**—Using extensive source material, author constructs a picture of Iranian climate. He includes distribution of temperature; pressure and wind, general and local; precipitation conditions, rain, snow, relative humidity, influence of rain on level of rivers, variations; effects of climate on vegetation and agriculture, on surface forms and on human life. *Subject Headings:* **Climatology, Iran.**

1891

2F–11 551.582.1(53)

Bethge, Oskar, **Das Klima Arabiens.** [The climate of Arabia.] Cassel, **1891.** 37 p. 4 tables, refs. **NN**—Generalized discussion of climates of different sections of Arabia given: west, east, south coasts, etc. Very small amount of data included on temperature and humidity conditions by months for Jidda and for Red Sea coast. *Subject Headings:* **Climatology, Jidda, Arabia.**

2F–12 551.515.2(267)

*Dallas, William Liscombe, **Arabian Sea. An inquiry into the nature and course of storms in the Arabian Sea and a catalogue and brief history of all recorded cyclones in that sea from 1648 to 1889.** *India, Meteorological Dept., Cyclone Memoirs*, No. 4:301–424, **1891.** 16 plates, tables, refs. **DWB,**

NN—All the more important information hitherto published on storms in the Arabian Sea is collected and arranged in two parts: one giving details of each storm, the other giving distribution and movements of storms according to months and seasons and including opinions of past meteorologists on cyclonology in the Arabian Sea. Storm charts are presented and conclusions as to the law of occurrence of storms and their tracks at different seasons are stated. *Subject Headings:* **Storms, Cyclones, Arabian Sea.**

2F–13 551.582(581)

*Dallas, William Liscombe, **On the meteorology and climatology of northern Afghanistan.** *India, Meteorological Dept., Memoirs*, Vol. 4, Pt. 7:505–527, **1891.** figs., tables, equations. **DWB, NN.** Review in German in *Meteorologische Zeitschrift*, V. 10, p. (83)–(84), 1893. **DWB, NN**—Observations, kept on an expedition in the region from Oct. 1884–Oct. 1886, are reported and discussed. Temperature means, variations, comparisons, etc. are calculated for Afghanistan as a whole rather than for particular place where observations were made. Pressure means are determined, using altitude corrections and stating locations of observations. Wind directions are calculated by months. Comparison made of Afghan and Indian weather. Climatological summary made of Afghanistan for each month. *Subject Headings:* **Climatology, Afghanistan, India.**

2F–14 551.515.2(267)

§Great Britain, Meteorological Office, **Daily weather charts for the period of six weeks ending June 25, 1885, to illustrate the tracks of two cyclones in the Arabian Sea.** London, **1891.** 12 p. 40 charts. **NN**—Synoptic charts show progress of two cyclonic storms in the Arabian Sea in May and June 1885. Brief explanatory comment accompanies charts. *Subject Headings:* **Cyclones, Synoptic charts, Arabian Sea.**

1892

2F–15 551.582(58)

Capus, Guillaume, **Observations et notes météorologiques sur l'Asie Centrale et notamment les Parmirs.** [Meteorological observations and notes on Central Asia, particularly the Pamirs.] *Société de Géographie, Bulletin*, Paris, 13:316–338, **1892.** tables, refs. **NNA**—Author relates personal observations made on expeditions, without attempting to summarize the 25-year collection of observations taken at Russian Turkistan stations. His account of the climatic elements is thoroughly descriptive, but contains only a small amount of his firsthand observational data. *Subject Headings:* **Climatology, Pamirs, Central Asia.**

2F–16 551.506(567)

*Hann, Julius, **Resultate der meteorologischen Beobachtungen zu Bagdad im Jahre 1888.** [Results of meteorological observations in Baghdad in the year 1888.] *Meteorologische Zeitschrift*, 9:113, **1892.** table. **DWB, NN**—Small amount of data given on air pressure, temperature, relative humidity, cloudiness, wind and rain for 1888 by months. *Subject Headings:* **Climatological data, Baghdad, Iraq.**

2F–17 551.582(55)

***Klima von Bushir und Mascat.** [Climate of Bushire and Masqat.] *Meteorologische Zeitschrift*, 9:21–26, **1892.** tables. **DWB, NNA**—Description and brief climatological data (1885–1888) are given for these two locations on the Persian Gulf. Reference made to original source from which data is taken. *Subject Headings:* **Climatology, Masqat, Oman, Bushire, Iran, Persian Gulf.**

1895

2F–18 551.501.6:551.46(539.3)

Meteorological charts of the Red Sea. Great Britain, Meteorological Office, Official No. 106. London, **1895.** 24 charts. **DWB, NN**—Winds, barometric pressure and air temperature are charted for each month at numerous points. The second 12 charts show currents, specific gravity and sea temperature in the Red Sea. Charts are constructed from observations contained in special logs for the Meteorological Office, from ship observations and from Netherlands meteorological observations. Few of the observations precede the opening of the Suez Canal in 1869. Most observations are from ships traveling the same route within narrow limits. *Subject Headings:* **Observational data, Oceanography, Red Sea.**

2F–19 551.582(53)

Nolde, E., **Zum Klima von Innerarabien.** [Climate of Inner Arabia.] *Meteorologische Zeitschrift*, 12:397–398, **1895. DWB, NNA**—Brief descriptive account of climate between Hoa and Haiyannieh is given as it appeared in author's account of an expedition in Inner Arabia, 1893. *Subject Headings:* **Climatology, Arabia.**

1896

2F–20 551.506(53)

*Eliot, J., **A discussion of the hourly observations recorded at Aden.** *India, Meteorological Dept., Memoirs*, 9:453–497, **1896.** 55 tables. **NN**—Observations kept from 1880–1893. Detailed tables include values for nocturnal radiation, temperature, pressure, wind, relative humidity, cloudiness and rain. *Subject Headings:* **Observational data, Aden.**

2F–21 551.582(58)

*Voeĭkov, (Woeĭkoff), Aleksandr Ivanovich, **Das Klima Zentralasiens nach den Beobachtungen von Prschewalsky.** [The climate of Central Asia from the observations of Prschewalsky.] *Meteorologische Zeitschrift*, 13:49–61, 90–100, **1896.** tables, refs. **DWB, NNA**—Summary made of the four expeditions of the Russian explorer, including: meteorological observations and the routes of travel; accounts of weather and climate of the four trips in chronological order; the four months' observations of M. W. Pjewzow's expedition in Nia, East Turkistan; and the author's summary of Central Asian climate. Wind, temperature, cloudiness, precipitation, and some pressure conditions are considered, and observations of these elements are tabulated. (*See also* item 2F–5.) *Subject Headings:* **Climatology, Central Asia.**

2F–22 551.582

*Voeĭkov, (Woeĭkoff), Aleksandr Ivanovich, **Das Klima Astrachans nach F. Schperk.** [The climate of Astrakhan according to F. Schperk.] *Meteorologische Zeitschrift*, 14:254–262, **1897.** tables, refs. **DWB, NN**—Author gives an extensive summary of a Russian work on the subject which includes the tabulated data for periods of from 15 to 70 years on temperature, wind, storms, precipitation, pressure, relative humidity, evaporation and clouds. *Subject Headings:* **Climatology, Astrakhan, U.S.S.R.**

1899

2F–23 551.524 551.571(559)

*Dallas, William Liscombe, **Investigation into the mean temperature, humidity and vapour tension conditions of the Arabian Sea and Persian Gulf.** *India, Meteorological Dept., Memoirs*, 6:9–88, 1894–**1899.** 19 plates, 72 tables. **NN**—Observations totaling 53,700 and covering a period of 22 years are used. Temperatures are considered, with mean temperatures calculated; values for extremes were not available, so hypothetical values are given. Humidity is taken up with tables showing mean humidity of the air by month over the area. Then the actual amount of vapor in the air is considered; tables show extensive values, means, ranges, variations. Finally, a section briefly discusses the lengthy tables that are appended. *Subject Headings:* **Temperature, Humidity, Vapor pressure, Arabian Sea, Persian Gulf.**

1903

2F–24 551.594(58)

*Hjuler, A., **The second Danish Pamir expedition . . . measurements of the electric tension of the air.** Copenhagen, **1903.** 25 p. tables. **DWB, NNA**—Besides the ordinary meteorological measurements of the expedition, records were kept of the electric potential of the air—both its actual value, and the variations at different heights. Results are discussed and tabulated. *Subject Headings:* **Atmospheric electricity, Pamirs, Central Asia.**

2F–25 551.506.1(58)

*Olufsen, Ole, **The second Danish Pamir expedition; meteorological observations from Pamir, 1898–99.** Copenhagen, **1903.** 91 p. figs., extensive tables. **NNA**—The Expedition's daily measurements of atmospheric pressure, temperature, humidity, clouds and winds are discussed and tabulated at length. Observations have been made at numerous points in the Pamir region. *Subject Headings:* **Climatological data, Pamirs, U.S.S.R.**

1904

2F–26 551.582(515)

Kaminski, A., **Climate of Ts'aidam.** International Geographic Congress, 8th, Washington, D. C., 1904. Report, p. 380–385. **1904.** 8 figs. **NN**—Charts of diurnal variations of pressure, temperature and humidity, and of annual variation of wind velocity, rainfall, temperature, humidity and cloudiness are drawn up from observations (1900–1901) at a second order meteorological station at Ta'aidam, which was established by a Russian expedition. Results are discussed briefly. *Subject Headings:* **Climatology, Ts'aidam, Tibet.**

2F–27 551.583(5)

Kropotkin, Prince P., **Desiccation of Eur-Asia.** *Geographical Journal*, 23:722–741, June **1904.** 2 maps. **NNA**—Author discusses considerable evidence, yielded by "recent" explorations in Central Asia, that the whole region which was once glaciated, is and has been in historic time in a state of rapid desiccation. Discussion follows. *Subject Headings:* **Climatic changes, Historical Climates, Eurasia.**

2F–28 551.582(58)

Olufsen, Ole, **The climate of the Upper Pandsh Valley.** (In **Through the unknown Pamirs; the second Danish Pamir expedition, 1898–99.** London, **1904.** p. 50–55. refs.) **NN**—General descriptive account of climate of the region is given from the expedition's observations; with reference to data sources elsewhere. *Subject Headings:* **Climatology, Upper Pandsh Valley, Pamirs, U.S.S.R.**

1905

2F–29 551.582(584)

Carnegie Institution of Washington, **Explorations in Turkestan with an account of the basin of Eastern Persia and Sistan. Expedition of 1903.** *Carnegie Institution of Washington, Publications*, No. 26. Washington, **1905.** 324 p. **DWB**—Climate and history are discussed on p. 302–313, but the work as a whole is mostly archeological, physico-geographical, and geological in scope, with very little on climate. *Subject Headings:* **Geography, Expeditions, Climatology, Turkistan, Iran.**

2F–30 551.506(584)

*Kashgar (Eastern Turkistan) [Observatory], [**Meteorological observations, Jan. 1, 1905–Jan. 4, 1906.**] **DWB**—These original observations recorded in pencil and unpaged have been "checked" at the Weather Bureau Library for 1905 only. *Subject Headings:* **Observational data, Kashgar, Eastern Turkistan, U.S.S.R.**

2F–31 551.583.2(584)

Huntington, Ellsworth, **The rivers of Chinese Turkestan and the desiccation of Asia.** *Geographical Journal*, 28:352–367, Oct. **1906.** map. **NNA**—Author believes a desiccation of Asia is in progress which is the last faint undulation of the great climatic wave of the glacial period. As a member of the Barrett Expedition to Chinese Turkistan, the author has been able to investigate evidence to further conclusions that the changing rivers and lakes and declining population of cities and agriculture of East Turkistan indicate desiccation. *Subject Headings:* **Climatic changes, Historical climates, Aridity, Chinese Turkistan.**

1907

2F–32 551.583(58)

†Berg, L., **Ist Zentral-Asien im Austrockenen begriffen?** [Is Central Asia in the process of drying up?] *Geographische Zeitschrift*, 13:568–579, **1907.** refs. **NNA**—Noting Kropotkin's argument for recent desiccation of Middle Asia, author adds other evidence not only for a historic but also for a prehistoric existence of such aridity. He includes the whole region of southwest and south Central Asia (north of India) and gives several references to other works on climatic changes in this region, many from Russian sources. *Subject Headings:* **Climatic changes, Near East, Middle East, Central Asia.**

2F–33 551.5:06.5(58):91.04(58)

*Ekholm, Nils Gustaf, **Meteorologie.** (In **Sven Hedin's Scientific results of a journey in central Asia 1899–1902.** Vol. V. Stockholm, [1904, **1907.**]) **DWB**—Pt. I, a. I. **Die Beobachtungen, 1894–1897 und 1899–1902.** [Observations. . . .] (401 p. of tables.) Report consists wholly of observational tables with explanatory introduction. The region of Central Asia in which the observations were taken includes some of China, Pamir, East Turkistan, Tibet, Ts'aidam, Nan Shan, Ala-shan and Ordos. Data includes values for pressure, temperature, humidity, wind, clouds, precipitation and actinometer readings. Pt. I, b. II. **Die Bearbeitung der Beobachtungen.** [Analysis of observations.] (47 p. 13 plates, extensive tables, refs., 9 equations.) Chapters analyze: pressure, temperature, wind, cloudiness, precipitation and moisture in the air. Plates contain mean pressure distribution on charts for different months. *Subject Headings:* **Climatology, Observational data, Central Asia.**

1908

2F–34 551.577.2(58)

von Ficker, Heinrich, **Niederschlag in zentralasiatischen Gebirgen.** [Precipitation in central Asian mountains.] *Meteorologische Zeitschrift*, 25:378–380, **1908.** table, refs. Remark by A.

VOEĬKOV, **Ist eine fortschreitende Austrocknung Turkestans vorhanden?** [Does a progressive desiccation of Turkistan exist?] *Ibid.*, 25:567–568. **DWB, NN**—Brief table and discussion given of 10 years of rainfall observations in the Pamir and Tien Shan ranges at Prschewalsk, Narynsk, Khorog, Irkeschtam and Pamir Post. *Subject Headings:* **Precipitation, Climatic changes, Central Asia.**

2F–35 551.582.2(584)

*von Ficker, Heinrich, **Zur Meteorologie von West-Turkestan.** [On the meteorology of West Turkistan.] *Vienna, (K.) Akademie der Wissenschaften, Math.-Naturw. Klasse, Denkschriften,* 81:533–567, **1908.** map, 13+tables, refs. **NNA**—Climate of West Turkistan is determined from results of ten years observations of a series of stations in the Russian network. Values are tabulated for numerous geographically and climatologically different points in region for temperature means, extremes, variations, relative humidity, precipitation amount and frequency, droughts, thunderstorms, cloud and wind. Appendixes give 10-year monthly averages of temperature and relative humidity for each station individually. *Subject Headings:* **Climatology, West Turkistan.**

1910

2F–36 551.588.3(53)

†Behn, Ernst, **Jemen, Grundzüge der Bodenplastik und ihr Einfluss auf Klima und Lebewelt.** [Yemen, characteristics of the land forms and influence on climate and way of life.] Inaug.-Diss.—Marburg. **1910.** 100 refs. **NNA**—One chapter discusses climate; others deal with physical geography, geology, vegetation, agriculture, etc. *Subject Headings:* **Climatology, Geography, Yemen.**

1911

2F–37 551.506(53)

*Hann, Julius, **Ergebnisse aus Dr. E. Gloser's (sic) meteorologischen Beobachtungen in San'â (el-Jemen).** [Results of Dr. E. Gloser's meteorological observations in San'â, (Yemen).] *Vienna, (K.) Akademie der Wissenschaften, Math. -Naturw. Klasse, Sitzungsberichte,* IIa, 120:1833–1896, **1911.** numerous tables, equations. **NN**—Report, including tables and discussion, of detailed observations kept at San'a in southern Arabia from Jan. through Oct. 1883. Averages and comparisons; daily and hourly observations on pressure, temperature, humidity, wind and other elements are also included. *Subject Headings:* **Observational data, San'a, Yemen.**

2F–38 551.582(567)

*Willcocks, Sir William, **Meteorology of Mesopotamia and Meteorological data, 1904–1910.** [In **The irrigation of Mesopotamia.** London, **1911.** Appendixes D and E. p. 67–88. tables.] **DWB**—Appendix D contains account of meteorology of eastern portion of valley of Euphrates and Tigris based on observations at Baghdad. Pressure, temperature, winds, humidity, clouds and rainfall conditions are taken up, and brief tables given. Appendix E consists wholly of meteorological readings from the Baghdad Observatory, mostly for 1909. *Subject Headings:* **Climatology, Climatological data, Baghdad, Tigris, Euphrates, Mesopotamia, Iraq.**

1912

2F–39 551.582.2(584)

Machatschek, Fr., **Zum Klima von Turkestan.** [On the climate of Turkistan.] *Meteorologische Zeitschrift,* 29:449–454, **1912.** 3 tables, refs. **NNA**—Climate of region is summarized in general. Earlier studies of Turkistan are reviewed with the conclusion that it is an arid, unfertile land. Brief tables give summarized rainfall data for Tashkent, Dschisak, Kazalinsk, Margelan, Samarkand and Aulie-Ata. *Subject Headings:* **Climatology, Turkistan.**

2F–40 551.578.46(56, 58)

Paschinger, Viktor, **Die Schneegrenzen in verschiedenen Klimaten.** [Snow lines in various climates.] *Petermanns Geographische Mitteilungen, Ergänzungsband,* 37, No. 173, **1912.** 93 p. figs., 5 plates, 11 tables, refs. **NNA**—Included among considerations of regions all over the world are discussion of the snow line, brief tables and numerous references for central and eastern Caucasus, Armenian Highlands, and Central Asia: Himalaya, Karakorum, Pamir, Hindu Kush and Tibet ranges. Part two discusses the snow line in relation to climatic elements and treats very briefly temperature, clouds, precipitation, etc. in scattered parts of Asia as well as of the rest of the world. *Subject Headings:* **Snow cover, Climatology, Caucasus Mountains, Armenia, Central Asia.**

1913

2F–41 551.582(584)

*Rickmers, W. Rickmer, **Climate.** (In **The Duab of Turkestan.** Cambridge, **1913.** p. 488–498, figs., maps, tables, refs.) **DWB, NNA**—As well as discussing and tabulating climatological values.

using statistical data of VON FICKER and HANN, author includes in appendix a treatment of influence of forests on climate, the snow line, glaciation, desiccation and climatic changes, and hydrographic and climatic characteristics of the Sea of Aral. *Subject Headings:* **Climatology, Turkistan, Aral Sea, U.S.S.R.**

2F–42 551.579(567)

Tholens, Rudolf, **Die Wasserwirtschaft in Babylonien (Irak, Arabi) in Vergangenheit, Gegenwart und Zukunft.** [Water economy in Babylonia (Iraq, Arabia) in the past, present and future.] *Gesellschaft für Erdkunde zu Berlin, Zeitschrift*, No. 5:329–347, **1913.** 7 figs., tables, ref. **DLC, NNA**—Use of the waters of the Tigris and Euphrates discussed along with some treatment of the climate of the region. *Subject Headings:* **Hydrology, Climatology, Tigris, Euphrates, Iraq, Arabia.**

2F–43 551.506.1(569)

*Hann, Julius, **Meteorologische Beobachtungen in Babylon in den Jahren 1911–1912.** [Meteorological observations in Babylon in the years 1911–1912.] *Meteorologische Zeitschrift*, 31:448–450, **1914.** tables, refs. **DWB, NNA**—Further meteorological observations on temperature, humidity, clouds, rain for region summarized as in *Meteorologische Zeitschrift*, 29:30–31, 346, 1912. *Subject Headings:* **Observational data, Climatology, Babylon, Iraq.**

1914

2F–44 551.582(584)

Voeĭkov (Woeĭkoff), Aleksandr Ivanovich, **Le Climat.** [Climate.] (In **Le Turkestan Russe.** [Russian Turkistan.] Paris, **1914.** p. 23–48. figs., tables, refs.) **NNA**—Climatic conditions are broadly described, giving figures and tabulated data to illustrate continentality of climate, temperature variations and extremes, types of vegetation, clouds and precipitation, snows of the mountains, dust, glaciers, etc. Other chapters take up climatic changes, hydrography, aridity, agricultural conditions. *Subject Headings:* **Climatology, Turkistan, U.S.S.R.**

2F–45 551.583.2(567)

Wallén, Axel, Wilhelm, **Mesopotamiens hydrografi i forntiden och i framtiden.** [Hydrography of Mesopotamia in past and in future times.] *Ymer*, 34:111–122, **1914.** 2 figs., table, 7 refs. **DLC, NN**—Chart shows variations in levels of Tigris at Baghdad from 1907–1911, and of Euphrates at Hit from 1910–1911. *Subject Headings:* **Hydrography, Historical climates, Tigris, Euphrates, Iraq, Mesopotamia.**

1917

2F–46 551.582(567)

Eredia, Filippo, **Sul clima di Baghdad.** [The climate of Baghdad.] (*R.*) *Società Geografica Italiana, Bollettino*, 6:436–444, **1917.** figs., tables, 5 refs. Reprint. **NNA**—Mean values for barometric pressure, clouds, relative humidity, vapor pressure and rainfall are tabulated; mostly calculated roughly from data collected over 15 years or so by various observers. *Subject Headings:* **Climatology, Observational data, Baghdad, Iraq.**

2F–47 551.582(567)

Uhlig, Carl, **Mesopotamien.** [Mesopotamia.] *Gesellschaft für Erdkunde zu Berlin, Zeitschrift*, No. 6, 7, 8:333–358, 397–430, 530–544, **1917.** 4 figs., 117 refs. **NNA**—General descriptive account given of geography, people, physical features, etc.; including brief treatment of climate in general and of particular sections around Baghdad and in northern parts. *Subject Headings:* **Climatology, Geography, Mesopotamia, Iraq.**

1918

2F–48 551.582(559)

§Schott, Gerhard, **Geographie des Persischen Golfes.** [Geography of the Persian Gulf.] *Geographische Gesellschaft in Hamburg, Mitteilungen*, 31:1–113, **1918.** figs., maps, tables, refs. **NNA**—In Pt. 4 entitled **Klima** (p. 32–46) the climatological elements discussed are water temperature, salt content and ocean currents; air temperature and relative humidity; rain, sunshine and cloudiness; wind and storms. Brief tables; wind, temperature and rainfall charts and two synoptic charts of southwestern Asia are included. *Subject Headings:* **Climatology, Geography, Persian Gulf.**

2F–49 551.582:656.6(267, 559)

*Schott, Gerhard, **Ozeanographie und Klimatologie des Persischen Golfes und des Golfes von Oman.** [Oceanography and climatology of the Persian Gulf and Gulf of Oman.] *Annalen der Hydrographie und Maritimen Meteorologie*, Beilage, Vol. 46, **1918.** 46 p. 9 figs., 7 plates, 20 tables, refs. **DLC**—Source of the observational material used comes particularly from daily records of ships

of the Hamburg American Line in the region. Geographical sketch is given; oceanography, discussed: water temperature, salt content, currents, etc. Fish, plant life, etc., noted. Section on climatology, p. 14–30, takes up: air temperatures, variations, etc.; humidity values and differences between land and sea; precipitation distribution and comparison with Mediterranean; cloudiness; and atmospheric pressure, wind and storms, including some values for Near East and Arabia and comparisons with Mediterranean. Extensive data are included. *Subject Headings:* **Climatology, Oceanography, Persian Gulf, Gulf of Oman, Near East, Arabia, Mediterranean.**

1919

2F–50 551.582.1 551.583.3(5)

Huntington, Ellsworth, **The pulse of Asia; a journey in Central Asia illustrating the geographic basis of history.** Boston, 1907. New ed. [1919]. 415 p. figs., maps, photos, 60 refs. **NN**—Book is primarily a record of a journey of exploration in central Asia, including description of physical features and their effects on the people of the mountains and of the desert. In addition, evidence is presented to support author's hypothesis of pulsatory climatic changes. References are mainly of a general geographical nature. *Subject Headings:* **Geography, Climatic changes, Central Asia.**

2F–51 551.577.2(567)

*(Iraq.) Office of Civil Commission, **Rainfall [observations], 1918–1919.** [Baghdad.] **1919.** map, figs., tables. **DWB**—Summary values given for stations in Iraq. Diagrams show comparison of rainfall of that year with normal. *Subject Headings:* **Rainfall, Iraq.**

2F–52 551.582.1(567)

*Normand, Charles William Blyth, **Climate and weather of Iraq.** [Baghdad Weather Bureau, Baghdad Gov't. Press, **1919.**] 45 p. 20 tables. **DWB, NNA**—After a brief discussion of the physical features of Iraq, general climatic conditions are noted; places where meteorological observations are available in and near Iraq are listed. Then follow separate, detailed discussions of meteorological elements: atmospheric pressure; winds, including upper air; humidity, clouds and fog; rainfall, thunderstorms, snow and river levels; optical phenomena and conditions affecting aviation. Extensive tables are appended for temperatures, rainfall, upper winds and river levels. *Subject Headings:* **Climatology, Climatological data, Iraq.**

2F–53 551.582:629.13(567)

*Normand, Charles William Blyth, **Meteorological conditions affecting aviation in Mesopotamia.** *Royal Meteorological Society, Quarterly Journal*, 45:368–379, **1919.** 6 figs., 3 tables. **NN**—Baghdad observations (1888–1918) of pressure, temperature, relative humidity, etc. are tabulated. Frequencies of wind direction at Babylon and Mosul are shown as well as frequency of wind directions at different heights above Mesopotamia in different seasons. Average wind velocities near Baghdad for 1908–1914 are illustrated. Average number of foggy days per month at Baghdad and Basra given. *Subject Headings:* **Aeronautical climatology, Mesopotamia, Iraq.**

2F–54 551.582(567)

*Ridpath, C. H. E., **Notes on the climate of Mesopotamia.** *Meteorological Magazine*, London, 54:90–91, 103, **1919.** 2 tables. **DWB, NNA**—Brief descriptive account plus very small amount of data taken on the roof of the British Residency, Baghdad. *Subject Headings:* **Climatology, Baghdad, Mesopotamia, Iraq.**

2F–55 551.582(58)

*von Ficker, Heinrich, **Untersuchungen über die meteorologischen Verhältnisse der Pamirgebiete. (Ergebnisse einer Reise in Ostbuchara).** [Investigations of meteorological conditions of the Pamir region; (results of a trip in East Buchara).] *Vienna, (K.) Akademie der Wissenschaften, Math.-Naturw. Klasse, Denkschriften*, 97:151–255, **1919.** 17 figs., map, 21 tables, refs. **NNA**—Author reports meteorological observations from half-year trip in east Buchara, combined with results of many years of observations from meteorological stations of West Turkistan. Contents include: comparisons of temperatures at different points, daily and annual temperature variations, temperature of earth and heat radiation, effects of altitude on temperature, annual and diurnal pressure conditions, moisture and relative humidity, cloud and dust, precipitation and wind conditions, high altitude climates, remarks on glaciers of Turkistan and increasing aridity of region. *Subject Headings:* **Mountain meteorology, Climatology, Pamirs, West Turkistan, U.S.S.R.**

1920

2F–56 551.524.37(567)

*Knoch, Karl, **Die ungewöhnlich strenge Kälteperiode in Mesopotamien Ende Dezember 1905.** [The unusually severe cold spell in Mesopotamia the end of December 1905]. *Meteorologische*

Zeitschrift, 37:229–230, **1920, NN**—Brief synoptic analysis of the period given, as well as tables for Dec. 21, 1905 to Jan. 1, 1906, showing temperature, cloudiness, wind, rain and snow. *Subject Headings:* **Temperature, Mesopotamia, Iraq.**

2F–57 551.524(479)

von Ficker, Heinrich, **Temperatur der Luft und des Wassers an den Ufern des Kaspischen Meeres.** [Temperature of the air and water on the shores of the Caspian Sea.] *Annalen der Hydrographie und Maritimen Meteorologie*, 48:222–232, **1920,** map, 6 tables, 3 refs. **NNA**—Air temperature data from 1894 to 1903, and air and water temperature data from 1904–1911, kept at stations on west and east coasts of the Caspian, are analyzed; means, variations, local influences, anomalies, relations between west and east and wind frequencies for January and June are established. *Subject Headings:* **Temperature, Air-sea temperature variations, Caspian Sea Region.**

2F–58 551.582 551.579.4(55)

von Niedermayer, Oskar, **Die Binnenbecken des Iranischen Hochlandes.** [The inner basins of the Iranian highlands.] Munich, **1920.** 59 p. map, figs., tables, refs. **NNA**—Paper is based on a scientific journey from 1912–1914 and on a round trip crossing of Persia and Afghanistan from 1915–1916. General descriptions of geological, climatological and hydrological characteristics are given. Temperature and climatic provinces, pressure and wind, and precipitation are taken up. Finally, the question of climatic changes is discussed, with the author giving his independent conclusions on the instability of postglacial climates in the region. Review by ELLSWORTH HUNTINGTON in *Geographical Review*, 11:319, 1921. *Subject Headings:* **Climatology, Geology, Hydrology, Climatic changes, Iran, Afghanistan.**

1921

2F–59 551.582(567)

***Averages and extremes at Bagdad, 1888–1918.** *Royal Aeronautical Society, Journal*, 25:576–577, **1921.** 2 tables. **DWB**—One table gives values for temperature, relative humidity, and rainfall by month; the other, temperatures inside different buildings at different times of day on July 21, 1921. *Subject Headings:* **Temperature, Relative humidity, Rainfall, Baghdad, Iraq.**

2F–60 551.510.42:551.555(567)

Normand, Charles William Blyth, **On dust-raising winds.** *India, Meteorological Dept., Memoirs*, Vol. 22, Pt. 7:575–581, 1913–**1921.** refs., equations. **NN**—Author presents some notes on dust phenomena observed in Mesopotamia. He discusses: dust columns or dust devils, dust storms, dust in high winds, the cause of dust-raising by wind, and turbulence and the density of dust at various heights. *Subject Headings:* **Dust storms, Dust devils, Turbulence, Mesopotamia.**

2F–61 551.582(55)

von Ficker, Heinrich, **Ergebnisse meteorologischer Beobachtungen in Husseinabad (Persien, Seistan).** [Results of meteorological observations in Husseinabad (Persia, Seistan).] *Meteorologische Zeitschrift*, 38:257–262, **1921.** tables, ref. **DWB, NN**—Author takes up temperature (giving some brief seasonal averages and variations), humidity, cloudiness and precipitation with seasonal values for cloud, rainfall, atmospheric pressure and wind distribution. Other table gives monthly values of all the above factors for Husseinabad. *Subject Headings:* **Climatology, Husseinabad, Seistan, Iran.**

1922

2F–62 551.582.1(559)

"Autolycus," The weather of the Persian Gulf. *Nautical Magazine*, 107:393–398, May **1922. NNA**—General descriptive account with no data. *Subject Headings:* **Climatology, Persian Gulf.**

2F–63 551.582(53, 688)

*Bobzin, E., **Vergleichende Betrachtung des Klimas und der kalten Auftriebströmungen an der südwestafrikanischen und südarabischen Küste.** [Comparative views of the climate and of the cold anabatic currents of the southwest coast of Africa and the south Arabian coast.] *Hamburg, Deutsche Seewarte und Marineobservatorium, Deutsche überseeische meteorologische Beobachtungen*, 23(H):1–18, **1922.** 3 plates, 10 tables, 42 refs. **NN**—Section on southeast Arabian cold upper current includes discussion of wind conditions, sea currents, air and water temperatures and their relations and salt content at the water surface. Tables give brief data on air temperatures, salt content of Arabian Sea and some meteorological means for southeastern coast of Arabia. *Subject Headings:* **Climatology, Ocean currents, Arabia, Arabian Sea, Africa, Atlantic Ocean.**

2F–64 551.577(56)

Clemence, Walter, **Summer temperature records in the Middle East.** *Royal Meteorological Society, Quarterly Journal*, 43:278–280, 1922. 2 figs., 2 tables. **DWB, NN**—Unusually high temperatures of the summer of 1921 in America and in Europe are shown to have been prevalent in the Middle East also, as is seen in brief tables for Baghdad and Basra. Difference in temperature between outdoor conditions and those prevailing in well-ventilated room in the city of Baghdad from June to Sept. 1921 are shown graphically. *Subject Headings:* **Temperature, Baghdad, Basra, Iraq.**

2F–65 551.555.6(58)

*Gölles, Franz, **Kältewellen im Gebiet des Kaspischen Meeres. (Wirkung einer grossen Wasserfläche auf kalte Luftmassen.)** [Cold waves in the region of the Caspian Sea. (Effects of a large water surface on a cold air mass).] *Vienna, (K.) Akademie der Wissenschaften, Math.-Naturw. Klasse, Sitzungsberichte*, IIa, 131:327–354, 1922. 5 figs., tables, refs. **NNM**—Author discusses the remarkable extension of the polar front as cold waves in the Caspian region. Cold waves on specific dates are synoptically analyzed and some data are given. *Subject Headings:* **Cold waves, Air masses, Synoptic studies, Caspian Sea Region.**

2F–66 551.543:551.555.6(58)

Gölles, Franz, **Untersuchungen über den Luftdruckgang bei Kältewellen im Gebiete des Kaspischen Meeres.** [Investigations of the air pressure change during cold waves in the region of the Caspian Sea.] *Meteorologische Zeitschrift*, 39:97–107, 1922. 9 figs., table, 2 refs. **DWB, NN**—Theoretical paper, an extract from a larger work, (*see item* 2F–65), discussing cold waves and atmospheric pressure in the region as seen in particular cases. *Subject Headings:* **Atmospheric pressure, Cold waves, Caspian Sea Region.**

1923

2F–67 551.582(58)

*von Ficker, Heinrich, **Untersuchungen über Temperaturverteilung, Bewölkung und Niederschlag in einigen Gebieten des mittleren Asiens.** [Investigations of temperature distribution, cloudiness and precipitation in some regions of Middle Asia.] *Geografiska Annaler*, 5:351–400, 1923. 6 figs., 15+tables, refs., append. **NNA**—Region includes 50° to 35° N. and from the borders of Persia and Afghanistan to East Turkistan and Mongolia, including Caspian, Semir and Altai, Kirghiz Steppe, etc. Temperature discussed; seasonal isotherms drawn; temperature relations and variations illustrated with data by regions and seasons and altitudes; relations with precipitation seen. Cloudiness and precipitation are taken up and data given in tables for different regions. Appended are extensive tables, by station and month (1894–1903), of temperature, mean cloudiness and yearly amounts and averages of precipitation. *Subject Headings:* **Climatology, West Turkistan, Caspian Sea region, U.S.S.R., Central Asia.**

1924

2F–68 551.582(581)

Furon, Raymond, **Sur le climat de l'est de l'Afghanistan.** [On the climate of eastern Afghanistan.] *Académie des Sciences, Paris, Comptes Rendus*, 178:110–111, Jan. 1924. **DWB, NN**—Three climatic zones are distinguished for eastern Afghanistan. Brief descriptive accounts of elements of temperature, snow and rain, winds, flora and fauna are given from a year's personal observation. No references or data are included. *Subject Headings:* **Climatology, Afghanistan.**

2F–69 551.506(05)(584)

***Turkistan, Central Statistical Office, Bulletin,** No. 31–39, May 1923–March 1924. Tashkent. In Russian. **DWB**—Bulletins contain meteorological data from the Turkistan Meteorological Institute as well as other types of extensive statistics on the country. *Subject Headings:* **Climatological data, Periodicals, Turkistan.**

1925

2F–70 551.582(58)

von Ficker, Heinrich, **Klimatologische Bemerkungen über Turkestan.** [Climatological remarks on Turkistan.] *Gesellschaft für Erdkunde zu Leipzig, Mitteilungen*, 1923–1925. p. 42–57. 5 figs., tables, refs. **NNA**—Author discusses briefly wind directions and accompanying weather conditions; then takes up temperature conditions and variations in Middle Asia in general and in the Pamirs in particular. He remarks on glacier conditions as well, and changes evident in historic times. *Subject Headings:* **Climatology, Climatic changes, Glaciation, Turkistan, Pamirs.**

1926

2F–71 551.582(47)

Büdel, Anton, **Das Klima Transkaukasiens.** [The Transcaucasian climate.] *Petermanns Geographische Mitteilungen, Ergänzungsheft*, 189:57–62, **1926.** 3 plates. **NNA**—General discussion including temperature, wind, precipitation, climate and elevation and water. No original data. *Subject Headings:* **Climatology, Transcaucasia.**

2F–72 551.515.13(267)

Normand, Charles William Blyth, **Storm tracks in the Arabian Seas.** Calcutta, **1926.** charts. **DWB**—Atlas illustrates tracks of all storms in Arabian Sea, up to 1925, whose histories are fairly definitely known. *Subject Headings:* **Storms, Arabian Sea.**

2F–73 551.582.2(539.3)

*Quennell, W. A., **Kamaran Island.** *Meteorological Magazine*, London, 61:44–46, **1926.** table. **DWB, NN**—Brief table and notes describe results of meteorological observations on the island from 1922–1925. Temperature, relative humidity, cloudiness, wind direction and days of rain are given for each month. *Subject Headings:* **Climatology, Kamaran Island, Red Sea.**

1927

2F–74 551.582(57)

*Köppen, Wladimir and Geiger, Rudolf, **Das Klima von russisch Mittelasien.** [The climate of Russian Central Asia.] *Petermanns Geographische Mitteilungen*, 73:274–276, **1927.** 3 tables, refs. **DLC, NNA**—Using data from Russian Central Asian network of stations, the authors have constructed a chart showing the climatic types for Turkmenistan, Kazakhstan and Kirgizia; tables of temperature, precipitation, cloud and humidity for each station and tables of direction and velocity of winds for different months in various parts of region. *Subject Headings:* **Climatology, Turkmen S.S.R., Kazakh S.S.R., Kirgiz S.S.R., Central Asia.**

1928

2F–75 551.506(581)

*Furon, Raymond, **Observations météorologiques à Kaboul (Afghanistan) en 1923 et 1924.** [Meteorological observations at Kabul, Afghanistan, in 1923 and 1924.] *Revue de Géographie Physique et de Géologie Dynamique*, 1:176–193, **1928.** 2 figs., tables, refs. **NNA**—Author reports in tables of some detail, his daily meteorological observations kept for nearly 2 years. He gives values by months for general climatic elements: temperature, wind, precipitation, cloudiness. Charts show annual variations of temperature, cloudiness and precipitation. Observational data are tabulated in some detail. *Subject Headings:* **Observational data, Kabul, Afghanistan.**

2F–76 551.524.36(567)

High temperatures in Iraq. *Meteorological Magazine*, London, 63:45–46, **1928.** table. **DWB NN**—Relations between high temperatures and northerly winds in summer in Iraq are described Föhn effect suggested as cause. Percentage frequencies of winds in July at 3000 ft. are given for near Baghdad. *Subject Headings:* **Temperature, Upper winds, Föhn winds, Iraq.**

2F–77 551.583.2(53)

Musil, Alois, **The alleged desiccation of Arabia and the Islamic movement.** (In **Northern Nĕgd.** *American Geographical Society Oriental Explorations and Studies*, No. 5, Appendix 10, New York, **1928.** 16 p.) Reprint. **NNA**—Author explains reasons why he rejects Caetani's hypothesis that Arabia has become increasingly drier during historical times. *Subject Headings:* **Historical climates, Climatic changes, Arabia.**

2F–78 551.524.7(567)

*Townesend, E. J. D., **Some notes on temperature gradients in Iraq.** *Royal Aeronautical Society, Journal*, 32:901–909, **1928.** 6 figs., 26 tables. **DLC, NN**—Results are tabulated and described for 26 flights over Iraq in which air temperatures up to 10,000 ft. were taken. Other temperature conditions in Iraq are treated briefly. *Subject Headings:* **Upper air temperatures, Vertical temperature gradient, Iraq.**

2F–79 551.582(581)

Trinkler, Emil, **Afghanistan; eine landeskundliche Studie auf Grund des vorhandenen Materials und eigener Beobachtung.** [Afghanistan; a geographic study on the basis of previous material and personal observations.] *Petermanns Geographische Mitteilungen, Ergänzungsband*, 42, No. 196, **1928.** 80 p. 13 figs., 4 maps, tables, 141 refs. **NNA, DWB**—Section on climate, p. 33–36, de-

scribes briefly temperature, atmospheric pressure, wind and precipitation and gives a small amount of data on temperature. Hydrography of the Heri-rud and Kabul Rivers are taken up briefly on p. 36–38. Rest of work deals with geographic and geologic features, animals, plants, agricultural regions, social and economic conditions and explorations. *Subject Headings:* **Climatology, Geography, Afghanistan.**

1929

2F–80 551.551:629.13

Durward, J., **Bumpiness on the Cairo-Basra air route.** *Great Britain, Meteorological Office, Professional Notes*, 4, No. 52, **1929.** 6 p. fig., table. **DWB, NNA**—Notes on bumpiness are based largely on information from the flight reports of Imperial Airways over region and from personal conversation with the pilots, and are purely qualitative. Observations cover one year period, 1927–1928. *Subject Headings:* **Turbulence, Aeronautical meteorology, Arabia, Iraq, Egypt.**

2F–81 551.576.12(539.3)

Linear nimbus cloud with rain. Bab el Mandeb. *Marine Observer*, 6:241, **1929.** figs. **DWB, NNA**—Brief extract from ship's log noting how ship steered exactly parallel to wall-like edge of rain cloud. *Subject Headings:* **Cloud structure, Rainfall, Bab el Mandeb, Red Sea, Gulf of Aden.**

2F–82 551.524.3(55, 54)

*Stättner, Henryk, **O wahaniach temperatury na obszarze Indyj przedgangesowych i na Iranie w latach 1910–1919.** [Variations in temperature in India and Iran during the years 1910–1919.] *Kosmos*, Lwow, Ser. A, 54(1–2):211–347, **1929.** 49 figs., 91 tables, refs. In Polish, French summary p. 253–255. **NNA.** Also: *Lwow, Uniwersytet, Instytut Geofizyki i Meteorologji, Komunikaty*, No. 48, **1929. DLC**—Data recorded mostly at numerous stations in India, but with some for Iran and Baluchistan. Tables of temperature values for 1910–1919 are summarized from *India Monthly Weather Review*. Influence of monsoons discussed at length. *Subject Headings:* **Temperature variations, Monsoons, Iran, India, Baluchistan.**

2F–83 551.582:63(581)

Vavilov, N. I. and Bukinich, D. D., **Zemledel'cheskiĭ Afganistan.** [Agricultural Afghanistan.] Leningrad, **1929.** 610 p. 4 refs. English summary p. 536–537. **DA—Climate** (p. 17–20) gives a brief general description of climatic conditions. The continental character of the climate is stressed; and a classification scheme which divides the territory into six climatic areas according to heat, moisture and elevation is given. Fragmentary data are cited. *Subject Headings:* **Agricultural climatology, Afghanistan.**—*C.K.*

1930

2F–84 551.582(58)

Figurovskiĭ, I. W., **Sal'ianskaia step'.** [The Salyany Steppe.] *Tiflis, Nauchno-issledovatel'skiĭ kraevedcheskiĭ kabinet, Zakavkazskiĭ kraevedcheskiĭ Sbornik, Estestvoznanie*, 1:278–300, **1930.** map, tables, 9 refs. English summary p. 298–300. **NNA**—Temperatures, precipitation, cloudiness and winds are described; numerous brief tables included. *Subject Headings:* **Climatology, Salyany Steppe, Azerbaijan, U.S.S.R.**

2F–85 551.582(584)

Penck, Albrecht, **Central Asia.** *Geographical Journal*, 76:475–487, **1930. NNA**—Geographic description includes some consideration of climate but no climatological data. Author considers chiefly Tibet, Sinkiang, southern Siberia; and briefly, Russian Turkistan. *Subject Headings:* **Geography, Climatology, Tibet, Sinkiang, Southern Siberia, Turkistan, Central Asia.**

2F–86 551.524.7(567)

*Peters, S. P., **Some observations of upper air temperature in Iraq.** *Great Britain, Meteorological Office, Professional Notes*, 4, No. 59, **1930.** 11 p. 6 figs., 6 tables. **DWB, NNA**—Results are recorded of seven airplane ascents made over Iraq in July and Sept. 1925, to take upper air temperature observations. Particular interest lies in ascents that recorded detailed information on the morning inversion of temperature near ground. Tables and adiabatic charts are included. *Subject Headings:* **Inversions, Upper air temperatures, Iraq.**

2F–87 551.524.2(56)

*Schneider-Carius, Karl, **Die Temperaturverhältnisse von Armenien.** [Temperature conditions in Armenia.] *Meteorologische Zeitschrift*, 47: 438–441, **1930.** 4 tables, 3 refs. **DWB, NNA**—Discussion and some tables of observations of temperature from the Russian network of stations in northeastern Armenia, 1894–1903. *Subject Headings:* **Temperature, Armenia.**

1931

2F–88 551.5:91.04(584)

*Alessandri, Camillo and Ginori, N. Venturi, **Geofisica: meteorologia, aerologie e pireliometria.** [Geophysics: meteorology, aerology and pyrheliometry.] Ser. 1, Vol. 3, (In **Spedizione Italiana de Filippi nell' Himalaia, Caracorum e Turchestan Cinese 1913–1914.** [De Filippi's Italian expedition to the Himalayas, Karakorum, and Chinese Turkistan.] Bologna, **1931.** 565 p. figs., 22 plates, extensive tables, refs., equations.) **NN**—Large volume which records in detail extensive observational data of the expedition, taken at different stations in different regions: temperature and pressure in relation to altitude; daily variations in pressure, temperature and vapor pressure; wind velocities and directions; pyrheliometric observations, etc. *Subject Headings:* **Climatological data, Aerology, Pyrheliometry, Himalayas, Karakorum, Chinese Turkistan.**

2F–89 551.577.37(53)

Floods in Arabia and the western desert of Egypt, December 1930. *Meteorological Magazine*, London, 66:64–65, **1931. DWB, NN**—Brief note describing extent and location of rain and accompanying synoptic conditions. *Subject Headings:* **Floods, Rainfall intensity, Arabia, Egypt.**

2F–90 551.554 551.557.2(54, 56)

Monthly normal isobars and wind-roses at 0.5, 1, 2, and 3 km. above sea-level over India and neighbourhood. *India, Meteorological Dept., Scientific Notes*, 1(8):109–112, **1931.** 12 charts, refs. **DWB, NNA**—Monthly normal isobaric charts prepared to give general picture of wind circulation at different levels over India and region over which Egypt-India air route "will lie." Data were used for computing charts from numerous stations in Iran, Iraq, Arabia, Palestine and Syria, as well as India and Burma. No tables included. *Subject Headings:* **Atmospheric pressure, Winds, India, Iran, Iraq, Arabia, Palestine, Syria.**

2F–91 551.582(55):629.13

*Loewe, F., **Ergebnisse von Studienflügen nach und in Persien 1928.** [Results of experimental flights to and in Persia in 1928.] *Beiträge zur Physik der freien Atmosphäre*, 17(2):126–175, **1931.** 16 figs., tables, 28 refs. **DWB, NN**—Article summarizes numerous air trips into Persia during which aerological observations were made. Geography of region is outlined. Aerological observations and observations taken during airplane flights are described and conditions over different parts of country are analyzed. Description and results of solar radiation measurements are given. *Subject Headings:* **Aeronautical climatology, Iran.**

2F–92 551.582(56)

*Schneider-Carius, Karl, **Klimatologie von Armenien.** [Climatology of Armenia.] *Petermanns Geographische Mitteilungen*, 77:69–75, **1931.** 2 figs., 2 tables, 5 refs. **DLC, NNA**—Averages of monthly observations for 1894 to 1903 from meteorological stations in Armenia are tabulated and discussed briefly. *Subject Headings:* **Climatology, Armenia.**

2F–93 551.515.8(567)

Thomas, W. and Rougier, L., **Report on line-squall observed at Mosul, April 11th, 1931.** *Meteorological Magazine*, London, 66:144–145, **1931.** 3 figs. **DWB, NN**—Note describes heavy squall at Mosul and accompanying synoptic conditions. Anemograms and autographic records of barograph and thermograph for that date are included. *Subject Headings:* **Line squalls, Thunderstorms, Mosul, Iraq.**

2F–94 551.506

*U. S. Hydrographic Office, **Sailing directions for the Persian Gulf including the Gulf of Oman and the Mekran Coast.** 2nd ed. Washington, **1931.** 357 p. map, tables, refs. Supplement, 1950. 27 p. H.O. No. 158. **NN**—Chapter I (p. 17–47) contains description of region which includes winds, climate, temperature, barometer, tides and currents, etc. Meteorological tables, appendix II (p. 322–330), contain observational data for different numbers of years taken from British Admiralty's Persian Gulf Pilot. *Subject Headings:* **Climatology, Marine meteorology, Persian Gulf, Gulf of Oman, Makran Coast.**

1932

2F–95 551.515.5(559)

Banerji, B. N., **The Bahrein storm and some studies of cold wedges over the Persian Gulf.** *Beiträge zur Physik der freien Atmosphäre*, 19:34–36, **1932.** fig., ref. **DWB, NN**—Figure gives isochrones of arrival of storm on Sept.–Oct. 1925. Phenomenon analyzed briefly. *Subject Headings:* **Storms, Cold fronts, Persian Gulf, Bahrein, Arabia.**

2F–96 551.582(53, 661)

*Brooks, Charles Ernest Pelham, **Le climat du Sahara et de l'Arabie.** [The climate of the Sahara and of Arabia.] Paris, Société d'Editions Géographique, Maritime et Coloniales, **1932.** 81 p. 17 figs., 11 tables, refs. At head of title: Société de Géographie, Paris. **Le Sahara; ouvrage publié sous la direction de Masauji Hachisuka. NNA**—Desert climates are discussed in general followed by detailed treatment of the deserts of the Sahara and the Arabian Peninsula. Barometric pressure and winds are taken up with figures showing mean isobars and predominant wind directions for different months. Storm phenomena are discussed: direction, duration, month of occurrence, etc. A chapter takes up rain, clouds, and fair weather: relative amounts, comparisons between the regions, etc. Another treats of distribution of temperature, giving annual means, extremes, etc. Humidity, dew, visibility and mirage are discussed. Geologic changes of climate and changes in historic times are noted. Emphasis seems to be on African region, although there is ample material included regarding Arabia. *Subject Headings:* **Climatology, Sahara Desert, Arabia.**

2F–97 551.582(539.3)

*Daking, C. W. G., **The meteorology of Kamaran Island (Red Sea).** *Royal Meteorological Society, Quarterly Journal*, 58:441–447, **1932.** fig., 3 tables. **DWB, NN**—General climatic conditions discussed using observations for about 10 years. Rainfall, pressure, temperature, relative humidity, clouds and wind data are briefly tabulated. *Subject Headings:* **Climatology, Kamaran Island, Red Sea.**

2F–98 551.582:656.6(539.3)

*Great Britain, Hydrographic Office, **Red Sea and Gulf of Aden pilot; comprising the Suez Canal, the Gulfs of Suez and Aqaba, the Red Sea, the Gulf of Aden, the south-east coast of Arabia from Ras Raghashwa to Ras al Hadd, the coast of Africa from Ras Asir to Ras Hafun, Socotra and its adjacent islands.** 8th ed. London, **1932.** 540 p. figs., tables, refs. **DWB**—Chapter I gives a general description of waters and countries bordering Red Sea and Gulf of Aden, including: pressure and winds, cyclones, sea temperatures, climate and weather, refraction, luminosity, currents and navigational and pilot information. Sailing directions are given for each region separately. Meteorological tables appear in appendix III, p. 488–501. *Subject Headings:* **Climatology, Marine meteorology, Red Sea, Gulf of Aden.**

2F–99 551.577.2(588)

*Roy, A. K. and Bhattacharya, R. C., **A preliminary study of rainfall at Quetta.** *India, Meteorological Dept., Scientific Notes*, 5(51):49–61, **1932.** fig., 11 tables. **NNA**—Rainfall records of Quetta Observatory from 1926–1931 are analyzed and tables are given of variations, frequencies and hourly amounts of rain during various seasons. Study of upper winds during rain seen applicable to forecasting rain at Quetta. *Subject Headings:* **Rainfall, Quetta, Baluchistan.**

2F–100 551.577.37(53)

*Semmelhack, W., **Ausserordenlich starker Regenfall in Djadda.** [Remarkably heavy rainfall at Jidda.] *Annalen der Hydrographie und Maritimen Meteorologie*, 60:41–42, **1932.** 3 figs., table. **DLC, NN**—A thunderstorm with heavy rainfall on Nov. 12, 1931, at Jidda is analyzed. Included is a brief table which gives air pressure, wind direction and speed and temperature averages for points in region from Port Said to Port Sudan for Nov. 10–13, 1931. *Subject Headings:* **Thunderstorm rainfall, Jidda, Arabia.**

2F–101 551.555.8(53)

Semmelhack, W., **Kalter Sandsturm in Djadda-Arabien.** [Cool sand storm in Jidda, Arabia.] *Annalen der Hydrographie und Maritimen Meteorologie*, 60:429–430, **1932.** 5 refs. **DLC, NN**—A sand storm, unusual because of accompanying sudden cooling, observed on July 23, 1932, is discussed briefly. *Subject Headings:* **Sand storms, Jidda, Arabia.**

1933

2F–102 551.582(581)

†*§Iven, Hans-Eberhard, **Das Klima von Kabul.** [The climate of Kabul.] *Geographische Wochenschrift*, Breslau, Beiheft 5, **1933.** 74 p. figs., tables, 111 refs. **DWB, NN**—This thorough study of climate of Kabul, Afghanistan, using his father's and his own observations for 1923–1929, includes sections on geographical position and climatic regions of Afghanistan. Detailed chapter on the meteorological elements takes up: atmospheric pressure, means, extremes, variations, etc.; wind, anemometer observations, wind distribution in 1924, numbers of stormy days; evaporation; humidity, mean relative humidity, vapor pressure, days with haze, and fog; cloud; precipitation, monthly and yearly means, extremes, frequency, intensity, variations, distribution, drought periods,

snowfall, hail, thunderstorms; temperature; cold air wedges in Afghanistan and India 1928/29; influence of Indian monsoon at Kabul; climatic change in historic time; plant life at Kabul; etc. *Subject Headings:* **Climatology, Kabul, Afghanistan.**

2F–103 551.557(567)

*Peters, S. P., **The vertical extent of north-westerly winds over Iraq in summer.** *Great Britain, Meteorological Office, Professional Notes*, 5, No. 64, **1933.** 10 p. 8 tables, ref. **NNA**—Conclusions are drawn as to this wind phenomenon through analysis of data of pilot balloon ascents in Iraq from heights from 1500 to 10,000 ft. *Subject Headings:* **Upper air winds, Iraq.**

2F–104 551.506(53)

Semmelhack, W., **Wetterberichte aus arabischen Zeitungen.** [Weather reports from Arabian newspapers.] *Annalen der Hydrographie und Maritimen Meteorologie*, 61:315–319, **1933.** 2 figs., 3 tables, 5 refs. **DLC, NN**—Occasional reports and some data from various parts of Arabia for 1932–1933 are included with very limited tables of maximum and minimum temperatures at Mecca, Medina, Jidda and Widj. *Subject Headings:* **Weather reports, Arabia.**

2F–105 551.582(58)

von Ficker, Heinrich, **Bemerkungen über das Klima der Pamirgebiete; einige Ergebnisse der Alai-Pamir Expedition 1928.** [Remarks on the climate of the Pamir region; some results of the Alai-Pamir expedition, 1928.] *Meteorologische Zeitschrift*, 50:81–87, **1933.** fig., table, refs. **DWB, NN**—Results of expedition discussed, along with some reference to earlier observations. Temperature and precipitation are noted, although very little data are included. Present day and ice age heights of the timber line are compared. *Subject Headings:* **Climatology, Pamirs, U.S.S.R.**

1934

2F–106 551.582(581)

Ahmad, Jamal-ud-Din and Aziz, Muhammad Abdul, **Climate and products.** (In **Afghanistan; a brief survey.** Kabul, **1934.** p. 29–36. table.) **NNA**—Brief discussion of climate: temperature, winds, rainfall, seasons and seven natural regions, along with outline of agricultural products. *Subject Headings:* **Climatology, Agricultural climatology, Afghanistan.**

2F–107 551.583.2(515)

de Terra, H. and Hutchinson, G. Evelyn, **Evidence of recent climatic changes shown by Tibetan highland lakes.** *Geographical Journal*, 84:311–320, **1934.** map, 6 figs., 4 plates, refs. **NNA**—Authors, through their geological and biological studies in summer of 1932, attained new information regarding changes of depth, of shore features and of related phenomena bearing witness to regional climatic oscillations of post-Quaternary Age. Data gathered by former explorers over 100-year period on water level and precipitation conditions in region can be compared. Good references made to accounts of earlier expeditions. *Subject Headings:* **Climatic changes, Water level variations, Precipitation, Tibet.**

2F–108 551.582:629.13

*Great Britain, Meteorological Office, **Aleppo–Baghdad–Karachi air route.** *Aviation Meteorological Report*, No. 3, **1934.** 33 p. map, 6 plates, tables. **DWB**—Route is divided into two more or less uniform climatological sections: Aleppo to Basra, Basra to Karachi. General descriptions of climate are given and detailed climatological tables for Hinaidi and Shaibah, along with upper wind roses; and for Bushire, Bahrein, Masqat, Jask, Pasni, and Karachi. Upper wind roses given for all but Bushire. *Subject Headings:* **Aeronautical climatology, Iraq, Persian Gulf, Makran Coast.**

2F–109 551.515.8(56)

Line squalls and heavy rain in Iraq and Palestine on May 14th–15th, 1934. *Meteorological Magazine*, London, 69:185–191, **1934.** 2 figs. **NN**—Synoptic conditions for days previous to storms in region analyzed. Anemograms and barograms shown. (*Same item* as No. 2E–107 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **Line squalls, Rainfall, Iraq, Palestine.**

2F–110 551.54:551.509.3(588)

Roy, A. K. and Bhattacharya, R. C., **On forecasting weather over northeast Baluchistan during the monsoon months July and August.** *India, Meteorological Dept., Scientific Notes*, 5(58):125–131, **1934.** 3 tables. **NNA**—Barometric pressure difference in south and north Punjab is a useful factor in weather prediction over northeast Baluchistan in July and Aug. Data for 1929–1933 are examined in this respect. *Subject Headings:* **Weather forecasting, Atmospheric pressure, Baluchistan, Punjab, India.**

2F–111 551.582.1(53)

Schröder, Gustav, **Klimatographische Witterungsschilderung No. 19. Seeverkehrsweg: Golf von Aden.** [Climatographical weather survey No. 19. Sea route: Gulf of Aden.] *Annalen der Hydrographie und Maritimen Meteorologie*, 62:215, 1934. **DWB, NN**—A rainy day in the Gulf of Aden is analyzed briefly. *Subject Headings:* **Climatology, Gulf of Aden.**

2F–112 551.582(54):629.13

*Veryard, Richard George and Roy, A. K., **Meteorological conditions affecting aviation over the Northwest Frontier.** Delhi, 1934. 40 p. map, 10 figs., 14 tables. **NN**—Contents include: geography; meteorological conditions over northwest frontier of India; details of weather in various areas such as Quetta, Pishin, Zhob Valley, Chagai, Waziristan, etc.; and summary of flying conditions. Tables give climatological data for Chitral, Drosh, Parachinar, Cherat, Peshawar, Quetta, etc.; upper wind frequencies and upper air temperatures at Quetta and Peshawar; and rainfall normals for all rain gage stations in North-West Frontier Province and northern Baluchistan. *Subject Headings:* **Aeronautical climatology, Baluchistan, Pakistan, North-West Frontier Province, India.**

1935

2F–113 551.577:551.513(56)

†*§Bauer, G., **Luftzirkulation und Niederschlagsverhältnisse in Vorderasien.** [Atmospheric circulation and conditions of precipitation in Asia Minor.] *Beiträge zur Geophysik*, 45:381–548, 1935. 13 figs., 34 maps, tables, 70 refs. **DLC, NNA**—A major contribution to the meteorological study of southwest Asia. Using observations 1895–1924, the author explains air mass growth, decay and movements, precipitation distribution, and especially the relations between the climate of southwest Asia and the overall circulation system of the earth. Meteorological analysis includes bordering regions of India, Iran, Russia, Egypt and southeastern Europe. Also included are detailed discussion and maps made of air pressure and air mass movements by seasons and months and of precipitation by months. Influence of seas, continental air masses, and local wind phenomena and systems noted. One hundred and twenty observation stations used. (*Same item* as 2E–110 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **Air mass movements, Precipitation, U.S.S.R., India, Iran, Egypt, Asia Minor.**

2F–114 551.582(515)

*Duncan, Marion H., **Eastern Tibetan weather.** *West China Border Research Society, Journal*, Chengtu, 4, [N.D.] 9 p. Typewritten. **DWB**—Descriptive account of weather given mostly for city of Batang and Yangtze and Mekong valleys. Data for 1927–1935 accompany Weather Bureau copy in original ledger in which they were recorded. *Subject Headings:* **Climatology, Tibet.**

2F–115 551.510.42(267)

Durst, C. S., **Dust in the atmosphere.** *Royal Meteorological Society, Quarterly Journal*, 61:81–89, 1935. fig., table. **NN**—A dusty atmosphere is described in which each particle is surrounded by air of different temperature and humidity to those of the general air mass; this picture is shown to be corroborated by the rising of haze tops, the air temperature over the Arabian Sea during the SW monsoon and the diurnal variation of wind in that region. *Subject Headings:* **Dust, Arabian Sea.**

2F–116 551.582.1:551.577.2(55, 56)

Primmer, George, **Adjustments to climate in Alpine Mediterranean Asia.** *Journal of Geography*, 34:21–32, Jan. 1935. 7 figs., 20 refs. **NNA**—Author considers climate of mountain area of southwest Asia, including Anatolia, Armenia, Transcaucasia, Iran, Afghanistan and Baluchistan. Charts show briefly some of the rainfall and temperature conditions at selected points. *Subject Headings:* **Climatology, Turkey, Armenia, Transcaucasia, Iran, Afghanistan, Baluchistan.**

2F–117 551.582.1(53)

*Rathjens, Carl and von Wissmann, Hermann, **Zum Klima von Mittel- und Südarabien.** [On the climate of middle and south Arabia.] *Annalen der Hydrographie und Maritimen Meteorologie*, 63:364–369, 1935. 6 figs., map, 3 tables, refs. **DLC, NN**—Climates of sections of this region are described in turn, including a limited amount of temperature and humidity data. Sections include Jidda, Hodeida and coastal and mountainous parts of Yemen. *Subject Headings:* **Climatology, Jidda, Hodeida, Yemen, Arabia.**

1936

2F–118 551.506.5(54)

*Bleeker, W., **Meteorologisches zu den 3 holländischen Karakorum-Expeditionen.** [Meteorological (observations) on three Dutch Karakorum expeditions.] (*K.*) *Akademie van Wetenschappen te Amsterdam, Proceedings*, 39(6–8):746–456, 839–845, 962–970, 1936. figs., 75+tables, refs. **NN**—

Extensive meteorological data kept for Hunza and eastern Karakorum on all three expeditions are reported in detail in tables. Values are given for temperature, humidity, cloud, and some precipitation, pressure, etc. *Subject Headings:* **Climatological data, Hunza, Karakorum.**

1937

2F–119 551.575.5(267)

Fog. South-eastern coast of Arabia. *Marine Observer*, 14:98, **1937. DWB, NNA**—Brief extract from ship's log noting unusual fog which was continuous from Ras al Hadd as far south as Khorya Morya Group. *Subject Headings:* **Fog, Arabian Sea.**

2F–120 551.582(26)(56)

*§Germany. Kriegsmarine, Oberkommando, **Handbuch für das Rote Meer und den Golf von Aden.** [Handbook for the Red Sea and the Gulf of Aden.] 3rd ed. Berlin, **1937. DLC—Klima und Wetter.** [Climate and weather.] (p. 26–41. figs. charts, tables.) Gives a descriptive account along with: summarized data for pressure, temperature, wind, etc., conditions in different sections; some representative synoptic charts for various types of storms; charts with wind roses; etc. Discussion of fog, haze and thunderstorms is included. *Subject Headings:* **Climatology, Marine meteorology, Red Sea, Gulf of Aden.**

2F–121 551.579 551.582(567)

*Ionides, Michael George, **Climate.** (In **The regime of the rivers Euphrates and Tigris; a general hydraulic survey of their basins including the river Karun, having particular reference to their lower reaches within Iraq, with information for the use of irrigation engineers, etc.** London, **1937.** Chap. III. p. 24–36. fig., 15 tables.) **NNA**—Wind direction in number of days per month for Mosul, Baghdad and Basra are tabulated, as well as number of days of dust, haze or sand storm. Daily temperature means recorded for 1922–1932 by months along with relative humidity. Mean annual rainfall records given for periods from 2 to 41 years. Mean annual runoff shown for rivers of region. *Subject Headings:* **Climatology, Hydrology, Tigris, Euphrates, Iraq.**

1938

2F–122 551.555.8(567)

*Coles, F. E., **Dust-storms in Iraq.** *Great Britain, Meteorological Office, Professional Notes*, 6, No. 84, **1938.** 14 p. 9 figs., 5 refs. **NNA**—Dust storms in Iraq are discussed with regard to: seasonal type, winter and summer; distribution; severity; visibility; probability; and in relation to rainfall and wind speed and direction. *Subject Headings:* **Dust storms, Iraq.**

2F–123 551.583.2(53)

Huzayyin, S. A., **Changement historique du climat et du paysage de l'Arabie du sud.** [Historical changes of climate and of landscape of southern Arabia.] *Congrès International de Géographie, Varsovie, Comptes Rendus*, 4:39–43, **1938.** refs. **NNA**—Author notes that indications of climate can be traced through three sources: archeological evidence, literary documents and traditional legends. No data. *Subject Headings:* **Historical climates, Climatic changes, Arabia.**

2F–124 551.583.2(53)

Huzayyin, S. A., **Climatic changes in S.W. Arabia during Pleistocene and recent times.** *Congrès International de Géographie, Amsterdam, Comptes Rendus*, 1:165–166, **1938. NNA**—Brief report of some of geologic observations from scientific expedition of Egyptian University to Yemen and Hadhramaut in 1936. No data. *Subject Headings:* **Climatic changes, Yemen, Hadhramaut, Arabia.**

2F–125 551.555(267)

Keeton, H., **Local winds. Indian Ocean. II. Red Sea, Arabian Coast and Persian Gulf.** *Marine Observer*, 5:52–53, **1938. NNA**—Descriptive accounts, with no tabulated data included, are given for the areas. Prevailing winds, seasonal variations and particular wind phenomena are noted. *Subject Headings:* **Winds, Persian Gulf, Red Sea, Gulf of Aden, Arabia, Gulf of Oman.**

2F–126 551.521.63(567)

*Kennedy, Walter P., **The intensity of ultra-violet radiation from the sky in Iraq.** *Royal Meteorological Society, Quarterly Journal*, 64:489–494, **1938.** fig., 2 tables, 15 refs. **NN**—Daily measurements of the ultraviolet component of northern sky shine at Baghdad (1936–1937) are given in graphic form and as monthly means. Other meteorological data are included to show trend and range of climatic variation and to indicate causes of fluctuation in ultraviolet values. Variables discussed, but integration of factors not attempted. *Subject Headings:* **Ultraviolet light, Radiation, Climatology, Baghdad, Iraq.**

2F–127 551.577.2(567)

Macfadyen, W. A., **Water supplies in Iraq.** *Iraq, Ministry of Economics and Communication, Geological Dept. Publication*, No. 1. Baghdad, **1938.** 206 p. figs., tables. **NNA**—Mainly concerned with the hydro-geologic aspects but includes some climatological discussion, data for 1888–1936 and rainfall maps of Iraq (p. 4–7). Scattered treatment of rainfall for various regions included in hydrological discussions. *Subject Headings:* **Hydrology, Geology, Climatology, Iraq.**

2F–128 551.582(57)

*Szymkiewicz, Dezydery, **Études climatologiques.** (27–30). [Climatological studies (27–30).] *Societas Botanicorum Poloniae, Acta*, Warsaw, 15(3):265–322), **1938.** 8 figs., 33 tables, 12 refs., 2 equations. **DA**—Chap. 28 deals with humidity in the climate of Siberia and Turkistan. Chap. 29 takes up briefly climate of Southern Georgia. Chap. 30 discusses winds on the steppes. The agricultural point of view is stressed. Tables for selected stations in regions of the respective chapters show precipitation, evaporation, fog, temperature, air pressure, wind velocities, insolation, etc. *Subject Headings:* **Climatology, Steppes, Turkistan, Siberia, Georgia, U.S.S.R.**

1939

2F–129 551.506(55)

*Field, Henry, **Contributions to the anthropology of Iran.** *Field Museum of Natural History, Anthropological Series*, 29:1–706, **1939.** figs., tables, refs. Suppl.: **Climatological data from Iran.** Washington, 1941. Photocopy with extensive tables, 5 refs. **NNM**—Chap. II. **The land and the people** (p. 16–36), contains some discussion of climate. Figures show distribution of rainfall and distribution of forests, grasslands, deserts; tables give annual rainfall in inches and variations of monthly mean temperatures. *Most important*, however, are the supplementary data to this paper. In *American Meteorological Society, Bulletin*, 22:121, March 1941, a paragraph gives notification of availability of photocopies or microfilms of weather reports from June 1, 1936 to May 31, 1937, recorded at the Anglo-Iranian Oil Company's stations at Abadan and Bibian. These tables, it is noted, are supplementary to the climatological data in FIELD "Contributions to the anthropology of Iran." *Subject Headings:* **Climatological data, Iran.**

2F–130 551.582.1(55)

Heuss, A., **Klimatographische Witterungsschilderung. Nr. 130: Iran. Witterungsverlauf in Herbsttagen in Teheran. Beobachtungstage: 28. September und 4. November 1938.** [Climatological description. No. 130: Iran. Weather conditions on fall days in Teheran, Sept. 28 and Nov. 4, 1928.] *Annalen der Hydrographie und Maritimen Meteorologie*, 67:200–201, **1939. DLC**—Weather conditions on these two days are very briefly described, noting especially unusual cloud formations and thunderstorm occurrence. *Subject Headings:* **Climatology, Teheran, Iran.**

2F–131 551.506(567)

Iraq. Meteorological Service, **Annual report of the director, No. 3, year ending 31st March, 1939.** Baghdad, **1939.** 9 p. In English and Arabic. **NNA**—Work of service reviewed; new stations described; cooperation with neighboring meteorological stations developed, etc. No data included. *Subject Headings:* **Meteorological services, Iraq.**

2F–132 551.582.2(567)

***Mean monthly temperatures and pressures at three selected hours, mean monthly maximum and minimum temperatures, absolute maximum and minimum temperatures and mean monthly rainfall.** *Iraq, Meteorological Service, Occasional Publication*, No. 1, **1939.** 8 p. 5 tables. In English and Arabic. **DWB**—Mean monthly temperatures at synoptic hours in Iraq (1929–1938) are tabulated, as well as mean pressure, temperature and rainfall values. *Subject Headings:* **Temperature, Atmospheric pressure, Precipitation, Iraq.**

2F–133 551.582(47)

†*Köppen, Wladimir Peter, **Klimakunde von Russland. 2. Hälfte (Teil N_2).** [Climatology of Russia; 2nd half (part N_2): tables.] (In **Handbuch der Klimatologie.** Köppen and Geiger (eds.), 3, N_2, Berlin, **1939.** figs., 15 tables, 14 refs.) **DWB**—Meteorological data collected from all over the U.S.S.R., including south central parts (in Central Asia), are presented and briefly discussed. *Subject Headings:* **Climatology, U.S.S.R., Central Asia.**

2F–134 551.582(51)

*Lu, Alfred, **A brief survey of the climate of Lhasa.** *Royal Meteorological Society, Quarterly Journal*, 65:297–302, **1939.** 10 tables. **NN**—Climatic elements are surveyed and some brief summarized data on pressure and winds, temperature, frost, precipitation and monthly averages of relative humidity, cloudiness, and days with haze are given. Conclusions drawn as to climatic

types of Tibet—tundra, and of southern Tibet—Cwb type in Köppen's classification. *Subject Headings:* **Climatology, Tibet.**

2F–135 551.513 551.587(54)

*Ramanathan, K. R. and Ramakrishnan, K. P., **The general circulation of the atmosphere over India and its neighbourhood.** *India, Meteorological Dept., Memoirs*, 36:189–245, **1939.** 8 figs., 74 plates, maps, extensive tables, 22 refs. **NNA**—"Neighborhood" includes Aden, Bahrein, Masqat, as well as numerous stations in India itself, and Burma. Charts show mean air movement in each month over the Indian region at different heights up to 8 km.; upper air temperatures deduced from change of wind with height; charts for lower levels contain, as insets, wind-roses for selected stations. Chief features of upper wind and temperature distribution in each month are described and relations to monsoons and storms pointed out. Tables of resultant and predominant winds, as well as frequencies of directions of cloud movement, are appended. *Subject Headings:* **Atmospheric circulation, India, Arabia.**

1940

2F–136 551.582.1(55)

Heuss, A., **Klimatographische Witterungsschilderung. Nr. 150: Iran. Witterungsverlauf an Frühlingstagen in Teheran. Beobachtungstag: 12. Mai 1940.** [Climatographic weather description . . . Iran. Details of weather on spring day in Teheran. Day of observation: May 12, 1940.] *Annalen der Hydrographie und Maritimen Meteorologie*, 68:331–332, **1940. DWB**—Hourly conditions are recorded prior to a dust storm. *Subject Headings:* **Climatology, Dust storms, Teheran, Iran.**

2F–137 551.582(55)

Heybrock, Werner, **Naturwissenschaftliche Beobachtungen in Iran.** [Scientific observations in Iran.] *Petermanns Geographische Mitteilungen*, 86:124–131, **1940.** 2 tables, ref. **NNA**—Brief meteorological observations are included in an account of a trip into the central Elburz Mountains, Iran in 1936. Very brief tables note cloud and wind and temperature conditions. *Subject Headings:* **Climatology, Elburz Mountains, Iran.**

2F–138 551.577.2(567)

Rainfall in Iraq, 1936–1939. *Iraq, Meteorological Service, Occasional Publications*, No. 3, Bagdad, **1940.** Unchecked. *Subject Headings:* **Rainfall, Iraq.**

2F–139 551.515.3:551.50(567)

Ockenden, C. V., **A contribution to forecasting in Iraq; small rotary systems in advance of a true cold front.** London, **1940.** 2 p. M.O.M. 375. **DWB**—Discusses problem of forecasting such whirls, which are considered devils on a very large scale. *Subject Headings:* **Dust devils, Weather forecasting, Iraq.**

1941

2F–140 551.582.1(56)

†*Boesch, Hans H., **Das Klima des Nahen Ostens auf Grund neueren Beobachtungsmateriales der Iraq Petroleum Company aus den Jahren 1935–1938.** [Climate of the Near East on the basis of new observational material of the Iraq Petroleum Co. for the years 1935–1938.] *Naturforschende Gesellschaft in Zürich, Vierteljahrsschrift*, 86(1–2):8–66, **1941.** 9 figs., 23 tables, 24 refs. **NNA**—At twelve stations along the Kirkuk to Baghdad pipe line, regular daily observations of temperature and precipitation were made; they are reported and analyzed here, giving a cross section of the climates of the region. Monthly tables, summary tables, graphs and maps present data. Detailed text discusses present data as well as other data for region and adjacent lands. Review by P. Meigs in *Geographical Review*, 32:675–676, 1942. *Subject Headings:* **Climatology, Observational data, Kirkuk, Baghdad, Iraq.**

2F–141 551.582(55)

Germany. Reichsamt für Wetterdienst, **Flugklimatische Übersicht über Iran.** [Aviation climatological survey over Iran.] Berlin, **1941.** 13 p. 8 figs. **DWB**—General description of Iranian climate is given. Weather in summer and in winter is outlined considering temperature, cloudiness, fog and wind conditions. Figures show pressure and precipitation distribution and wind roses. *Subject Headings:* **Aeronautical climatology, Iran.**

2F–142 551.582(515)

Hanson-Lowe, J., **Notes on the climate of the South Chinese-Tibetan borderland.** *Geographical Review*, 31:444–453, **1941.** 3 figs., 17 refs. **NNA**—Author outlines general weather conditions of

region of eastern Tibet, giving peculiarities of particular regions: Kantse, Litang, Taofu and Chanhwa. He takes up the temperature and precipitation regimes in particular, and the climates and microclimates of the gorges. *Subject Headings:* **Climatology, Tibet, China.**

2F–143 551.582(515)

Hsü, Ginn-tze, **A note on the climatic conditions of Lhasa.** *American Meteorological Society, Bulletin*, 22:68–70, **1941.** refs. **NNA**—Brief descriptive account, with no data, is given for each climatic element of Lhasa, Tibet, and the climate in general is classified according to Köppen's system. *Subject Headings:* **Climatology, Tibet.**

2F–144 551.573(581)

Stenz, E., **On evaporation capacity in Kabul.** *Afghanistan, Meteorological Service, Publication*, Kabul, No. 2, **1941.** Unchecked. *Subject Headings:* **Evaporation, Kabul, Afghanistan.**

1942

2F–145 551.582(55, 567, 588)

Benner, Charles Parker and Gibbons, John J., **Climatology report on Iran, Iraq and Baluchistan.** (In **California Institute of Technology, Military Climatology.** Vol. 1, **1942.** 21 p. maps, figs., table, 13 refs.) **DWB**—Generalized, descriptive treatment based on standard sources. Some topography and geography and general elements of the climate of each country are discussed with charts illustrating precipitation, pressure distribution, streamlines, etc. Table gives mean temperatures and rainfall (1893–1920) for various stations in region. *Subject Headings:* **Climatology, Iran, Iraq, Baluchistan.**

2F–146 551.582(515)

Berning, Warren W. and Van Vessem, John, **A report on the military climatology of Chinese Turkestan and Tibet.** (In **California Institute of Technology, Military Climatology.** Vol. 1, **1942.** 17 p. maps, figs., table, 7 refs.) **DWB**—Geography and general climatic elements are discussed. Sections take up: precipitation and clouds; temperature, thermal activity, and winds; air masses and storm tracks; flying conditions; föhn winds, dust, thunderstorms, fog, haze and mean temperatures in various towns in the Tarim Basin and surrounding territory. *Subject Headings:* **Climatology, Tarim Basin, Chinese Turkistan, Tibet.**

2F–147 551.582:656.6(559)

*§Germany. Kriegsmarine, Oberkommando, **Handbuch für den Persischen Golf.** [Handbook for the Persian Gulf.] 3rd ed. Berlin, **1942. DLC—Klima und Wetter** (p. 17–34. figs., tables), gives summarized data on temperature, rainfall and wind conditions. Representative synoptic charts illustrate particular weather phenomena, seasonal conditions, storms, etc. Wind roses are drawn. *Subject Headings:* **Climatology, Marine meteorology, Persian Gulf.**

2F–148 551.582(559):656.6

*Great Britain. Hydrographic Office, **Persian Gulf Pilot, comprising the Persian Gulf and its approaches, from Ras al Hadd, in the south-west, to Cape Monze, in the east.** 9th ed. London, **1942.** 286 p. figs., tables, refs. **DWB**—Chapter I takes up general description of meteorology and pilot information for Persian Gulf, Arabia, Iraq, Persia and Baluchistan. Other chapters discuss individual regions from a navigational point of view. Meteorological tables appear on p. 38–44. *Subject Headings:* **Climatology, Marine meteorology, Persian Gulf.**

2F–149 551.582(567)

Climatological means for Iraq. *Iraq, Meteorological Service, Occasional Publication*, No. 7, Baghdad, **1942.** 43 p. map. Available in Royal Meteorological Society Library, London.—Unchecked. *Subject Headings:* **Climatology, Iraq.**

2F–150 551.582(53, 567, 55)

Mellen, William P., **The climate of Arabia, Iraq, and Persia (Iran).** (In **California Institute of Technology, Military Climatology.** Vol. 1, **1942.** 13 p. map, 4 figs.) **DWB**—General descriptive survey based on standard sources. *Subject Headings:* **Climatology, Arabia, Iraq, Iran.**

2F–151 551.582(56, 47)

*U. S. Air Weather Service, **Climate and weather of the Asiatic portion of the Union of Soviet Socialist Republics and of its air approaches.** Washington, D. C., **1942.** 77 p. 28 figs., numerous tables. **NN**—Area includes briefly such stations of southwest Asia as: Baghdad, Abadan, Teheran, Tiflis, Baku, Krasnovodsk (on Caspian), Ashkhabad, Kerki, Termez, etc. Those outside U.S.S.R.

are not discussed at any length; but they are included in climatological tables which give monthly means for numerous places in and near Asiatic U.S.S.R. on temperature, precipitation, fog, gales, thunderstorms, cloudiness, winds. *Subject Headings:* **Climatology, U.S.S.R., Baghdad, Iraq, Abadan, Teheran, Iran.**

2F–152 551.582(567, 55)

*Fletcher, Lyle R., **General climatic conditions of Iraq and Iran.** *U. S. Weather Bureau, Special Report* No. 164, **1942.** *U. S. Army Air Forces Report* No. 214. 10 p. 11 tables. **DWB**—Brief general climatic survey given along with more detailed discussion of temperature, precipitation, fog, humidity, cloud, winds, hail, thunderstorms, ceilings, days below freezing. Tables of corresponding data are given for stations in Iraq, Iran and Erivan, Lenkoran and Tiflis, U.S.S.R. *Subject Headings:* **Climatology, Iraq, Iran, U.S.S.R.**

2F–153 551.582(56, 55)

Fletcher, Lyle R. and Bristow, Gerald C., **Southwestern Asia: Iraq, Iran, Syria—May to August.** *U. S. Weather Bureau, Special Report* No. 24, **1942.** *U. S. Army Air Forces Report* No. 50. 8 p. table. **DWB**—Temperature, precipitation, cloud, fog, haze and dust, and equipment are discussed for each area separately. Table shows cloudiness at different cities of the three countries by months. *Subject Headings:* **Climatology, Iraq, Iran, Syria.**

2F–154 551.582(515)

*Frankel, Morris H., **Climatic statistics for selected stations in China, Tibet, and Mozambique.** *U. S. Weather Bureau, Special Report* No. 173, **1942.** *U. S. Army Air Forces Report* No. 254. 8 p., tables. **DWB**—Values for relative humidity, cloud, days with precipitation, absolute maximum and absolute minimum temperatures and mean precipitation for four years at Lhasa, Tibet, given along with more extensive data from China and Mozambique. *Subject Headings:* **Climatological data, Lhasa, Tibet, China, Mozambique.**

2F–155 551.557(569)

*Frankel, Morris H., **Upper air data for selected stations in Iraq.** *U. S. Weather Bureau, Special Report* No. 142, **1942.** *U. S. Army Air Forces Report* No. 205. 19 p. tables. **DWB**—Values for percentage frequency by directions and by velocity groups for different altitudes, tabulated for Mosul, Rutbah, Shaibah, and Hinaidi, Iraq, for period from 1922–1932. *Subject Headings:* **Upper air winds, Mosul, Rutbah, Shaiba, Hinaidi (Baghdad), Iraq.**

2F–156 551.582.2(53)

*Reed, Wesley W., **Climatic statistics for Kuwait, Arabia.** *U. S. Weather Bureau, Special Report* No. 56, **1942.** *U. S. Army Air Forces Report* No. 94. 1 p. **DWB**—Values for temperature, precipitation, and cloudiness are averaged by months for 7–8 year period in table. *Subject Headings:* **Climatological data, Kuwait, Arabia.**

2F–157 551.577.2(5)

*Reed, Wesley, W., **Rainfall data for selected stations in India, Afghanistan and Iran, and for Beiram Ali, U.S.S.R.** *U. S. Weather Bureau, Special Report* No. 65, **1942.** *U. S. Army Air Forces Report* No. 105. 2 p. tables. **DWB**—Greatest and least precipitation values are averaged by month for 9 year period for Pamir Post and Termez, Afghanistan—and for Seistan, Iran, 7 year period, and for Beiram, U.S.S.R., 17 year period, as well as similar values for numerous stations in India for different periods. *Subject Headings:* **Rainfall, Observational data, India, Afghanistan, Iran, U.S.S.R.**

1943

2F–158 551.577.2(515)

Lee, J., **The rainfall distribution of the Tibetan Plateau and its surrounding regions.** Nanking, National Research Institute, Institute of Meteorology, [1943.] 13 p. 6 plates. English translation of 4 p. Available in Royal Meteorological Society, London, Library.—Unchecked. *Subject Headings:* **Rainfall distribution, Tibet.**

2F–159 551.506(267)

*U. S. Hydrographic Office, **Sailing directions for the Red Sea and the Gulf of Aden.** H.O. 157, Washington, **1943.** 549 p. map, tables, refs. Supplement, 1950. 26 p. **NN**—Chapter I (p. 15–58) gives general descriptive remarks on the region including winds and weather, sea temperature, currents, pilotage, etc. Appendix III (p. 491–503) consists of meteorological tables for stations of region and of the ocean area for varying periods of years. Tables refer to "authority": British Red

Sea and Gulf of Aden Pilot, 1932. Report consists mainly of hydrographic material and sailing instruction. (*See item* 2F–98.) *Subject Headings:* **Climatology, Marine meteorology, Red Sea, Gulf of Aden.**

1944

2F–160 551.553.12(54, 581)

Fedders, W., **Beiträge zu Lokalwindsystemen in Hindukusch.** [Contributions to local wind systems in Hindu Kush.] *Zeitschrift für angewandte Meteorologie*, 61(5–6):85–90, **1944. DWB**—Opens with a brief climatic description of the Hindu Kush. During the day an extensive system of rising sand-bearing mountain winds develops, followed by descending winds at night. The peculiar winds of Kabul are next described. *Subject Headings:* **Local winds, Hindu Kush, Afghanistan, India.**—*C.E.P.B.*

2F–161 551.506(267, 559)

†*Great Britain, Meteorological Office, **The Gulf of Aden and West Arabian Sea,** Part 2. And, **The Persian Gulf and Gulf of Oman.** Part 3. (In **Weather in the Indian Ocean.** Vol. 2. **Local information.** M.O. 451b (2), **1944.** 182 p. 41 figs., 15 tables, 105 refs. And M.O. 451b (3), 1941. 139 p. 35 figs., 8 tables, 43 refs.) Available in **DWB**—Extensive meteorological surveys made, and many data are included. Topics covered are: pressure, annual and diurnal variations; depressions and tropical cyclones; winds, surface and upper air; visibility; cloud; rain and hail; temperature, surface, upper air, and sea; humidity; thunderstorms, dust, and sand storms, sand-devils and water spouts, and refraction. Excellent and important bibliographies divided by subject and region included. *Subject Headings:* **Observational data, Gulf of Aden, Arabian Sea, Persian Gulf, Gulf of Oman.**

2F–162 551.582(53)

*Huzayyin, S. A., **Notes on climatic conditions in south-west Arabia.** (Based upon a meteorological record taken by the Egyptian University Scientific Expedition to Yaman (sic) and Hadhramaut, 1936.) Appendix to: Tewfik, Mohamed, **The desert locust—movements in south-west Arabia.** *Société Fouad 1er d'Entomologie, Bulletin*, 28:1–43, **1944.** p. 31–43. 2 tables. Reprint. **NNA.** Also reprinted in *Royal Meteorological Society, Quarterly Journal*, 71:129–140, 1945. **NNA**—Descriptive account of a regional survey for a single season given. Records are fragmentary and incomplete but taken at large number of localities and supplemented with information from local inhabitants. Conclusions are tentative. Brief tables give temperature and relative humidity values for places in Yemen and Hadhramaut and rainfall in San'aa from government meteorological stations. *Subject Headings:* **Climatology, Arabia.**

2F–163 551.586(567)

†*Morton, T. C., **Heat effects in British service personnel in Iraq.** *Royal Society of Tropical Medicine and Hygiene, Transactions*, 37:347–372, May **1944.** 4 figs., 2 tables, 9 refs. **DSG**—Article contains a brief description of the climate of Iraq and graphs showing the march of air temperature and relative humidity at Hinaidi from June to Sept., 1930–1931, and maximum and minimum daily temperature and corresponding relative humidity at Hinaidi and Shaibah during Aug. Primarily, this article is a discussion of heat effect on white troops: namely, the clinical manifestation of syncope, hyperpyrexia, and heat exhaustion. The treatment, prophylaxis, pathology and causation of these effects are discussed. *Subject Headings:* **Climatology, Medical meteorology, Iraq.**—*I. L.D.*

2F–164 551.582 551.579(567)

Sousa, Ahmed, **Iraq irrigation handbook. Part 1. The Euphrates.** Bagdad, **1944.** Chapter IV. Climatology, p. 21–33. fig., 9 tables, 8 refs. **NNA**—Brief discussion of climate is accompanied by good tables, using data for rainfall, temperature, wind, pressure, etc., for years from about 1900 to 1941. The climate, rainfall, and runoff of the Euphrates Basin are briefly described, but the publication discusses principally use of water, irrigation, etc. *Subject Headings:* **Climatology, Hydrology, Irrigation, Euphrates, Iraq.**

2F–165 551.557(539.3)

Tournier, R., **Sondages aérologiques pour servir à l'étude des vents au-dessus de la Mer Rouge.** [Aerologic soundings for studying winds above the Red Sea.] *La Météorologie*, p. 217–220, July–Dec. **1944. NN**—Results of aerologic soundings are summarized and analyzed with respect to wind conditions over the Red Sea. No data included. *Subject Headings:* **Upper air soundings, Upper air winds, Red Sea.**

1945

2F–166 551.579(567)

Ashbel, Dov, [**Hydrologic conditions in Iraq.**] *Yalkut Hamizrach Hatichon*, Jerusalem, 11:81–93, July–Aug. **1945.** 4 figs. In Hebrew, no English summary. **NNZ**—*Subject Headings:* **Hydrology, Iraq.**

2F–167 551.582.3(567)

Climatological atlas for Iraq. *Iraq, Meteorological Service, Publication*, No. 8. Bagdad, **1945.** 108 p. maps and charts. **NNA**—Values represented in maps and charts of: mean isobars, mean daily maximum and minimum temperatures, vapor pressure, mean isohyets (rainfall), seasonal rainfall, duration of daylight, tracks of depressions, frequency of surface winds from specified directions at Bagdad and Basra, and mean vector wind at Bagdad airport. *Subject Headings:* **Climatology, Iraq.**

2F–168 551.582 551.509.34(55)

§U. S. Air Weather Service, **Studies on local forecasting, Teheran, Iran.** *Weather Division Report*, No. 600–218, **1945.** 15 p. 6 figs., table. **DWB**—Geographic and topographic considerations discussed, as well as effects of land and water masses, smoke pollution sources, seasonal conditions, typical anticyclonic weather conditions. Table shows monthly expectancy of weather at Teheran. Illustrative synoptic charts included. *Subject Headings:* **Weather forecasting, Teheran, Iran.**

1946

2F–169 551.582(55):656.7 551.506.2(55)

*Great Britain, Meteorological Office, **Meteorological report on West Persia.** *Aviation Meteorological Report*, No. 33. London, **1946.** 34 p. map, 3 figs., tables. M.O.M. 365/33. **DWB**—Report deals with meteorological conditions over area of Persia bounded by Caucasus mountains and Caspian Sea to the north and the 30th parallel in the south. Three geographical sections and principal features of their climates are outlined. Precipitation and thunder, visibility, cloud, wind, pressure, temperature and humidity, snow cover, and ice accretion and the freezing level are discussed, with some data and illustrations. Appendices include climatological summaries, percentage frequencies of surface wind directions at Teheran and Isfahan, tables of visibility, low cloud, and ground conditions. *Subject Headings:* **Climatology, Aeronautical climatology, Iran.**

2F–170 551.506(567)

*Iraq. Ministry of Economics, Principal Bureau of Statistics, **Meteorological tables. Section I.** (In *Statistical abstract;* 1944 and 1945. Baghdad, **1946.** p. 1–15. 24 tables.) **NNA**—Values of pressure, temperatures, humidity, sunshine, and meteorological phenomena (snow, fog, thunder, hail) computed in tables as monthly and average values for 1944–45, and some averages for 1923–1944. Brief descriptive account of weather in Iraq for 1944 included on p. A to D. *Subject Headings:* **Climatology, Observational data, Iraq.**

2F–171 551.553.5(53)

Murray, G. W., **Possible change in Arabian wind direction.** *Geographical Journal*, 108:147–148, **1946.** **NNA**—Letter noting change in dunes, but finding no need to postulate a change in Arabian climate in historic time. *Subject Headings:* **Wind variations, Climatic changes, Arabia.**

2F–172 551.582.1:91.04(53)

Thesiger, Wilfred, **A new journey in Southern Arabia.** *Geographical Journal*, 108(4–6):129–145, Oct.–Dec. **1946.** 11 photos. **NNA**—General descriptive account, noting people, mores, vegetation, some details relevant to climate, etc. No data given in this article, although a daily weather record of the trip was kept. (Weather record is at Royal Geographical Society's House, London.) *Subject Headings:* **Climatology, Geography, Arabia.**

2F–173 551.582.1(581)

†*Stenz, Edward, **The climate of Afghanistan, its aridity, dryness and divisions.** New York, Polish Institute of Arts and Sciences in America, **1946.** 14 p. figs., 9 tables, 21 refs. **DWB**—From scanty climatic data, mostly from Kabul for 13 years and partly from short records made at 9 other stations in Afghanistan and a few across the borders, the climatic conditions of temperature, rainfall, precipitation, humidity, vapor pressure, aridity factor, saturation deficit, GORCZYNSKI's definitions of steppe and desert climates, are interpreted for the whole earth and for Afghanistan in particular. *Subject Headings:* **Climatology, Afghanistan.**—*M.R.*

1947

2F–174 551.582(56)

*Boesch, Hans H., **Das Klima des Nahen Ostens.** [The climate of the Near East.] *Naturforschende Gesellschaft in Zürich, Vierteljahrsschrift*, 92:20–31, March **1947.** 2 figs., tables, refs. Reprint. **NNA**—Additional observations taken (*see item* 2E–140 in May 1951 *Meteorological Abstracts*) at Qaiyarah, Gusair, Kirkuk, and Baiji, Iraq of temperature, precipitation, and relative humidity. Some notes on climate and agriculture in Kurdistan are added. *Subject Headings:* **Climatology, Iraq, Kurdistan.**

2F–175 551.582:551.585.7(515)(235)

Flohn, Hermann, **Zum Klima der Hochgebirge Zentralasiens.** [On the climate of the high mountains of Central Asia.] *Meteorologische Rundschau*, 1(3–4):95–97, Sept.–Oct. **1947. DWB**—*Subject Headings:* **Climatology, Central Asia.**

2F–176 551.506.5:551.584(584.6)

*Laĭkhtman, D. L. and Sapozhnikova, S. A. (ed.), **Fizika prizemnogo sloia atmosfery. . . .** [Physics of the layer of air near the ground: (Aryssk expedition 1945.)] *Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Nauchno-issledovatel'skikh Uchrezhdeniĭ, Trudy, Ser. 1, Meteorologiia*, No. 39, **1947.** 112 p. **DWB**—Results are given (in several papers by expedition members) of expedition conducted in Aug. and Sept., 1945, in region of Arys', 125 km. NNW of Tashkent, to determine soil and air conditions (temperature, wind, humidity, insolation, etc.) in the boundary layer. Appendices give daily surface, upper air and actinometric observations. Review by Malcolm Rigby, *American Meteorological Society, Bulletin*, 29:420, Oct. 1948. *Subject Headings:* **Climatology, Arys', U.S.S.R.**

2F–177 551.577.2(515)

Lu, A., **Precipitation in the South Chinese-Tibetan borderland.** *Geographical Review*, 37(1):88–93, Jan. **1947.** 2 figs., 7 refs. **NNA**—General descriptive account given of climatic conditions of SE Tibet, drawn mostly from observations of vegetation. Rainfall is discussed and a precipitation map given, along with discussion of frontal activity which is the main cause of precipitation in the area. *Subject Headings:* **Precipitation, Tibet, South China.**

2F–178 551.577.2(53)

Yemen, Ta'izz, Meteorological Office, **Precipitation in Taizz (sic) and Sana'a Yemen, 1944–1947.** Taiz, **1947.** 2 p. Available in Royal Meteorological Society Library, London.—Unchecked. *Subject Headings:* **Precipitation, Ta'izz, Yemen.**

1948

2F–179 551.573:551.468

Forbin, Victor, **La Caspienne en voie d'assèchement.** [The Caspian on the way to drying up.] *La Nature*, Paris, 76:138–139, **1948.** 4 figs. **DLC**—Problem of the drying up of the Caspian Sea is presented, and some proposed remedies discussed briefly. *Subject Headings:* **Aridity, Water level variations, Evaporation, Caspian Sea.**

2F–180 551.510.42:595.7(53)

Rainey, R. C. and Waloff, Z., **Desert locust migrations and synoptic meteorology in the Gulf of Aden area.** *Journal of Animal Ecology*, 17:101–112, Nov. **1948.** 6 figs., 10 refs. Reprint. **NNA**—Meteorological data relating to a number of swarm movements of desert locusts recorded in the Gulf of Aden area (1941–1947) are examined, using corresponding synoptic charts. Direct relation between the trajectories of air and the swarms is found and discussed. Significance of convection currents in relation to flying locusts is pointed out. *Subject Headings:* **Synoptic meteorology, Aerobiology, Locusts, Gulf of Aden.**

1949

2F–181 551.579(58)

Kunin, V. N., **Zadachi izucheniia rezhima vod v pustyniakh Sredneĭ Azii.** [Problems of the investigation of the water regime in the deserts of Middle Asia.] *Problemy Fizicheskoĭ Geografii*, 14:104–114, **1949.** 2 figs., ref. **DLC**—The ground waters of the Middle Asian deserts are classified into those originating at considerable distances from a given locality and those of local origin. The geologic and geomorphologic factors determining the formation, occurrence and mineralization of ground waters of distant origin and the relationship of their water tables to surface relief and irrigation are discussed. In the case of local ground waters whose water table depends upon local precipitation the author considers the relationship between "effective precipitation" and level of water tables,

and the role of underground evaporation and condensation and of transpiration. (*Same item* as No. 2.4–156 in April 1951 *Meteorological Abstracts.*) *Subject Headings:* **Ground water, Deserts, Central Asia, U.S.S.R.**

2F–182 551.579:551.49(581)

Stenz, Edward, **Sieć wodna w Afganistanie.** [Water resources in Afghanistan.] *Przegląd Meteorologiczny i Hydrologiczny*, Warsaw, No. 1–4:30–41, **1949.** 2 figs., 12 refs. English summary p. 32–41. **DWB**—The author discusses the past and present glaciation in Afghanistan, the drainage areas, the individual rivers and their discharge and the lakes. (*Same item* as No. 2.5–164 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **Water resources, Hydrology, Afghanistan.**—*I.L.D.*

1950

2F–183 551.506.1(53)

*Arabian Oil Company, **Saudi Arabia weather data: 1940–1950.** Washington, D. C., **1950.** charts, table. Unpublished. **DWB**—Report includes all available data assembled by the Arabian Oil Co. field organization, including a memorandum, together with pertinent chart attachments which give information on rainfall, wind velocity, temperature, etc., dating from 1940. *Subject Headings:* **Climatological data, Saudi Arabia.**

2F–184 551.554:551.524.4(54)

Chaudhury, A. M., **On the vertical distribution of wind and temperature over Indo-Pakistan along the meridian 76°E in winter.** *Tellus*, 2(1):56–62, Feb. **1950.** 10 figs., 17 refs. **DWB, NN**—Aerological data used to construct a mean meridional cross section showing effect of Himalaya Range on mean solenoidal and wind fields in upper atmosphere. (*Same item* as No. 6–38 in June 1950 *Meteorological Abstracts.*) *Subject Headings:* **Atmospheric circulation, Jet stream, Pakistan, India, Siberia.**

2F–185 551.513:551.515.3(624, 5)

El-Fandy, M. G., **Effects of topography and other factors on the movement of lows in the Middle East and Sudan.** *American Meteorological Society, Bulletin*, 31(10):375–381, Dec. **1950.** 9 figs., table, 5 refs., 4 equations. **MH-BH**—The mean pressure distribution from the Middle East to the southern Sudan, characteristic of the four seasons, and the annual variation of the Sudan monsoon Low are described. The average track of the annual march of the Sudan Low is centered near ranges of high mountain and possesses a component that follows the apparent elevation of the sun. Air currents, which do not obey pressure gradients and which are designated as "effective currents," flow along the Abyssynian Plateau because of convergence into the Sudan Low and along the Persian Plateau because of convergence into active depressions near Cyprus during winter. It is suggested that the theory of images may explain these phenomena. *Subject Headings:* **Atmospheric circulation, Sudan monsoon Low, Sudan, Middle East, Mediterranean.**—*I.L.D.*

2F–186 551.582.2(567)

*Meteorological Service climatological means for Iraq. *Iraq, Meteorological Service, Publication.* No. 9, Bagdad, **1950.** map (showing all meteorological stations), numerous tables, 16 refs. **MH-BH**—Includes most up-to-date data concerning the climate of Iraq. Observatories listed along with the years for which they kept observations, their location, and their altitude. Tables give mean values of temperature, pressure, relative humidity, vapor pressure, low cloud amount and total cloud amount, for different times and years. Wind, rainfall, fog, dust, also noted. *Subject Headings:* **Climatological data, Iraq.**

2F–187 551.55:551.588.2(58)

†Obruchev, V. A., **Zametki o dvukh raĭonakh neobychaĭnykh bur' v Tsentral'noĭ Azii.** [Notes on two regions of unusual storms in Central Asia.] (In **Pamiati Iuliia Mikhaĭlovicha Shokal'skogo, Sbornik statei.** [In Memory of Iuliĭ Mikhailovich Shokal'skiĭ, Collected works.] 2:7–25, **1950.** 2 figs., 15 refs.) **DLC**—Two regions in Central Asia, one of which is situated between the Altai and Tien Shan ranges on the border of Dzungaria and the other at the southern foothills of the eastern Tien Shan adjoining the extensive depression of Dzungaria fringing the northern foothills of the mountain chain, are characterized by very severe winter storms which in their intensity are unusual even for Central Asia which is characterized by strong winds. The orography of these regions is described and it is suggested that the violent storms are of orographic origin. The author quotes descriptions of these storms written during the period 1300 to 1900 and also reports personal observations. *Subject Headings:* **Climatology, Wind storms, Orographic effects, Central Asia.**—*I.L.D.*

2F–188 551.594.7

Unusual report on radar performance from the T.S.S. Clan Davidson on a voyage from Suez to Aden. *Marine Observer*, 20(150):212–216, Oct. **1950.** 2 figs. **MH-BH**—False echoes recorded on constant bearing 10 to 3 miles in superrefraction, May 7–8, 1949. Notes by HOPKINS and DE PAGE. Explanation obscure. (*Same item* as 2.2–172 in Feb. 1951 *Meteorological Abstracts.*) *Subject Headings:* **Radar echoes, Red Sea.**

2F–189 551.557

*Venkiteshwaran, S. P., **Winds at 10 kms. and above over India and its neighbourhood.** *India, Meteorological Dept., Memoirs*, 28, Pt. 2, **1950.** p. 55–120+. 4 figs., 72 charts, tables, 15 refs. **DWB**—Contains a thorough analysis of pilot balloon data for levels up to 20 km., over the north portion of the Indian Ocean and adjacent parts of Asia. (For more complete abstract *see item* 2.6–88.) *Subject Headings:* **Upper winds, Zonal circulation, India, Middle East.**—*M.R.*

1951

2F–190 551.582:016(56)

†Kramer, Harris P., **Selective annotated bibliography on the climatology of the Near East.** *Meteorological Abstracts and Bibliography*, 2(5): 373–404, May **1951.** 239 refs. **DWB**—Often items which include primarily material on the Near East may include as well description or data on the climate bordering countries of the Middle East. Both the Outline of Contents and the Subject Heading index in that edition of *Meteorological Abstracts* will indicate such material by country. *Subject Headings:* **Climatology, Bibliographies, Near East, Middle East.**

SUPPLEMENTARY MATERIAL

2F–191 551.582(55, 58)

George, Pierre, **U.R.S.S. Haute-Asie—Iran.** [U.S.S.R. High Asia—Iran.] Paris, Presses Universitaires de France, **1947.** 534 p. 51 figs., plates, tables, refs. **DLC**—Part B (p. 103–147) contains sections on climatic phenomena: pressure, temperature, ice, precipitation; climatic regions; climates of Central Asia, the mountain borders and central Siberia and local climates. The section on hydrology consists mainly of a discussion of rainfall–runoff relations in various regions. Part C (p. 163–170) takes up the climate of the Arctic with a discussion of various elements at several representative Arctic stations. Also a discussion of the climate of Mongolia is found on p. 493–495, and of Iran and Afghanistan on p. 505–509. *Subject Headings:* **Climatology, Central Asia, Iran, Afghanistan.**—*M.R.*

2F–192 551.509.3(54)

§Malurkar, S. L., **Notes on analysis of weather of India and neighbourhood.** *India, Meteorological Dept., Memoirs*, 28, Pt. 4:139–215, **1950.** 17 figs., refs. **DWB**—A detailed and scholarly treatment of the problems of synoptic analysis and forecasting from synoptic charts in the Middle East. Chapters are included on: 1) mean pressure distribution across the latitudes, 2) isobaric patterns, 3) isobaric types with given pressure and wind values, 4) mean pressure and wind direction in tropics, 5) evolution of a tropical cyclonic storm, 6) analysis of charts for Dec. 14 and 15, 1945. . . . (*Same item as* No. 2.6–29.) *Subject Headings:* **Synoptic analysis, Air mass characteristics, India.**—*M.R.*

2F–193 551.582:(515)

Strachey, Henry, **Physical geography of western Tibet.** London, William Clowes, **1854.** 69 p. fold. map. **DLC**—After a detailed description of physiography, glaciers, floods and break-up of ice in spring, the author gives a remarkably vivid description of the various climatic factors he encountered during 2 years in and around the town of Leh which is in the upper reaches of the Indus. Based in villages at high elevations (10–15,000 ft.) and making a score of crossings of the even higher passes through the ranges (17–20,000 ft.), he made continual measurements of pressure temperature of air in sun and shade, earth temperatures in borings, observed winds, clouds, rainfall, snow, snow line, lightning, etc. He found frost every night in winter and temperatures from 35–70° in summer at 12,000 ft. while at 15,000 ft. or above, frost occurs every night. In summer thawing occurs up to 20,000 ft. in the day time. *Subject Headings:* **Climatology, Physiography, Indus Valley, Tibet.**—*M.R.*

2F–194 551.582(56)

*U. S. Weather Bureau, **Climate of Southwestern Asia.** . . . *U. S. Air Weather Service Report* No. 410, (U. S. Weather Bureau P. R. No. 1, rev.) Washington, D. C., **1945.** 206 p. 91 figs., 35 tables, 4 p. of refs. **DWB**—A general climatic survey of weather conditions for flying operations in region. An extensive discussion of climate, topographic and weather conditions is made; seasonal conditions of all climatic elements (ceilings, icing, visibility, etc.) discussed in length. (*Same abstract* as No. 2E–185 in May 1951 *Meteorological Abstracts.*) *Subject Headings:* **Climatology, Aeronautical climatology, Near East, Middle East.**

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section, are for information only, and will not be listed in either the author or subject indexes. When material is furnished in advance of date of publication, the pagination may be omitted.

American Geophysical Union, Transactions, Volume 32, Number 2, April 1951.

Press, Franc, Crary, A. P., Oliver, Jack and Katz, Samuel: **Air-coupled flexural waves in floating ice,** p. 166–172.

Howell, Wallace E.: **A comparison of icing conditions on Mount Washington with those encountered in flight,** p. 179–188.

Lettau, Heinz: **Theory of surface-temperature and heat-transfer oscillations near a level ground surface,** p. 189–200.

Morison, J. R.: **The effect of wave steepness on wave velocity,** p. 201–206.

Fries, Carl, Jr., and Celedonio Gutierrez: **Activity of Parícutin Volcano from January 1 to June 30, 1950,** p. 212–221.

Linsley, Ray K. and Kohler, Max A.: **Variations in storm rainfall over small area,** p. 245–250.

Deutsche Hydrographische Zeitschrift, Volume 3. Number 5/6, 1950.

Carruthers, J. N., Lawford, A. L. and Veley, F. C.: **Continuous observations from anchored vessels on water movements in the open sea,** p. 277–286.

Nusser, Franz: **Die Vereisung des Lilliehöökfjordes (Spitzbergen) in den Jahren 1941/42 und 1942/43,** [Ice condition in Lilliehöökfjord (Spitzbergen) in 1941/42 and 1942/43], p. 286–293.

Hansen, Walter: **Triftstrom und Windstau,** [Drift current and wind effect], p. 303–313.

Dietrich, Günter: **Über systematische Fehler in den beobachteten Wasser- und Lufttemperaturen auf dem Meere und über ihre Auswirkung auf die Bestimmung des Wärmeumsatzes zwischen Ozean und Atmosphäre,** [Systematic errors in the observed surface water and air temperatures at sea and their effect on the determination of the heat exchange between the sea and the atmosphere], p. 314–324.

Joseph, Joachim: **Untersuchungen über Ober- und Unterlichtmessungen im Meere und über ihren Zusammenhang mit Durchsichtigkeitsmessungen,** [Investigations into the measurements of submarine illumination at small and great depths, and into their relation to transparency measurements], p. 324–335.

Geofisica Pura e Applicata, Vol. 19, No. 1–2, January–March 1951.

Lettau, Heinz: **On the heat budget of the moon and the surface temperature variation during a lunar eclipse,** p. 1–18.

Berg, Hellmut: **Bemerkungen zur Meteorologie der Ionospäre,** [Remarks on meteorology of the ionosphere], p. 33–38.

Georgi, J.: **Reduktion der Strahlungsmessungen auf mittlere Sonnen-Entfernung,** [Reduction of the radiation measurement to the mean solar distance], p. 44–46.

Bouët, Max: **La dissymétrie des régimes pluviaux au Nord et au Sud des Alpes Suisses,** [The assymetry of the rainfall regime in the northern and southern Swiss Alps], p. 47–51.

Faust, Heinrich: **Atmosphärische Fronten und Vertikalaustausch,** [Atmospheric fronts and vertical exchange], p. 52–59.

Berg, Hellmut: **Bericht über die Tagung der Deutschen Geophysikalischen Gesellschaft in Hamburg vom 23. bis 28.10.1950,** [Report on the meeting of the German Geophysical Society in Hamburg on Oct. 23 to 28, 1950], p. 100–104.

Schneider-Carius, K.: **Bericht über die Tagung der Meteorologischen Gesellschaft in Hamburg vom 25. bis 29.10.1950,** [Report on the meeting of the Meteorological Society in Hamburg on Oct. 25 to 29, 1950], p. 105–107.

Indian Journal of Meteorology and Geophysics, Volume 2, Number 1, January 1951.

Satakopan, V.: **Rainfall analysis for multipurpose water power projects in India,** p. 9–24.
Malurkar, S. L.: **Surface wet bulb potential temperatures in and near India—Normal values and a study in disturbed weather,** p. 25–40.
Sarma, Vittal V.: **Comparison of geostrophic winds on constant pressure surface with observed winds in India,** p. 41–47.
Newton, C. W.: **Note on the mechanism of Nor'westers of Bengal,** p. 48–50.
Krishnaswamy, K. R.: **Some characteristics of rainfall at Poona,** p. 51–56.
Pramanik, S. K.: **The lunar atmospheric tide at Trivandrum and Aqustia,** p. 57–58.
Letters to the Editor:
Agrawala, K. S.: **The mobility of the small ions of the atmosphere at Poona,** p. 63–65.
Asnani, G. C.: **Computation of convergence in a hailstorm situation,** p. 65–67.
George, C. A.: **Dust-squalls at Madras,** p. 67–69.
Articles in Hindi:
Mull, S.: **Usefulness of the science of meteorology,** p. 71–74.
Mathur, L. S.: **Meteorology and weather forecasting,** p. 75–78.
Srivastava, M. P.: **Meteorology and war,** p. 79–81.
Sohoni, V. V.: **The future of meteorology,** p. 82–84.

Journal of Geophysical Research, Volume 56, Number 1, March 1951.

Scott, James C. W.: **The gyro-frequency in the Arctic E-layer,** p. 1–16.
McNicol, R. W. E. and de V. Gipps, G.: **Characteristics of the Es region at Brisbane,** p. 17–31.
Barnard, V.: **The approximate mean height of the thundercloud charges taking part in a flash to ground,** p. 33–35.
Feinstein, J.: **The interpretation of radar echoes from meteor trails,** p. 37–51.
Helliwell, R. A., Mallinckrodt, A. J. and Kruse, F. W., Jr.: **Fine structure of the lower ionosphere,** p. 53–62.
Hines, C. O.: **Wave packets, the poynting vector, and energy flow: Part I—Non-dissipative (anisotropic) homogeneous media,** p. 63–72.
Kawai, Naoto: **Magnetic polarization of tertiary rocks in Japan,** p. 73–79.
Weber, A. M. and Roberts, Elliot B.: **The 1950 world isogonic chart,** p. 81–84.
Gartlein, C. W. and Moore, R. K.: **Southern extent of Aurora Borealis in North America,** p. 85–96.
Moore, R. K.: **A V.H.F. propagation phenomenon associated with aurora,** p. 97–106.
Birch, Francis: **Recent work on the radioactivity of potassium and some related geophysical problems,** p. 107–126.

Meteorological Magazine, London, Volume 80, Number 945, March 1951.

Lamb, H. H.: **Essay on frontogenesis and frontolysis. Part II,** p. 65.
Bushby, F. H.: **Relaxation methods and their application to meteorological problems,** p. 71.
Gordon, A. H.: **Development of modern technique in marine meteorology,** p. 78.
Letter to the Editor
Virgo, S. E.: **Conditional instability over the highlands of Scotland,** p. 88.
Notes and News
Hurst, G. W.: **High-level cloud photographs,** p. 89.
Review
Bull, G. A.: **Keil, K.—Handwörterbuch der Meteorologie,** p. 91.

Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia, Volume 82, Number 2, March–April 1950.

Khromov, S. P.: **Geograficheskoe razmeshchenie klimatologicheskikh frontov,** [Geographical distribution of climatalogical fronts], p. 126–137.
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Multanovskiĭ, B. P.
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